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FILE 'CAPLUS' ENTERED AT 13:04:45 ON 06 OCT 2004
L1 38 RESONAN? (5A) (CHAMBER OR CAVITY)(S) RAMAN
L2 38 (RESONAN? (5A) (CHAMBER OR CAVITY))(S) RAMAN
L3 806 DNA (S) RAMAN
L4 195 L3 AND (COHERENT OR ENHANCED OR STIMULAT?)
L5 60 L4 AND RESONAN?

L1 ANSWER 1 OF 38 CAPLUS COPYRIGHT 2004 ACS on STN
ACCESSION NUMBER: 2004:381120 CAPLUS
DOCUMENT NUMBER: 141:113655
TITLE: Mesoscopic cavity quantum electrodynamics with quantum dots
AUTHOR(S): Childress, L.; Sorensen, A. S.; Lukin, M. D.
CORPORATE SOURCE: Department of Physics, Harvard University, Cambridge, MA, 02138, USA
SOURCE: Physical Review A: Atomic, Molecular, and Optical Physics (2004), 69(4), 042302/1-042302/8
CODEN: PLRAAN; ISSN: 1050-2947
PUBLISHER: American Physical Society
DOCUMENT TYPE: Journal
LANGUAGE: English
AB We describe an electrodynamic mechanism for coherent, quantum-mech. coupling between spatially separated quantum dots on a microchip. The technique is based on capacitive interactions between the electron charge and a superconducting transmission line resonator, and is closely related to atomic cavity quantum electrodynamics. We investigate several potential applications of this technique which have varying degrees of complexity. In particular, we demonstrate that this mechanism allows design and investigation of an on-chip double-dot microscopic maser. Moreover, the interaction may be extended to couple spatially separated electron-spin states while only virtually populating fast-decaying superpositions of charge states. This represents an effective, controllable long-range interaction, which may facilitate implementation of quantum information processing with electron-spin qubits and potentially allow coupling to other quantum systems such as atomic or superconducting qubits. REFERENCE COUNT: 36

L1 ANSWER 2 OF 38 CAPLUS COPYRIGHT 2004 ACS on STN
ACCESSION NUMBER: 2004:308599 CAPLUS
DOCUMENT NUMBER: 140:317656
*TITLE: "Resonance Raman spectroscopic microprobe analysis system and potential use for nucleic acid sequencing"*
*INVENTOR(S): Berlin, Andrew; Gerth, Christopher; Koo, Tae-Woong*
*PATENT ASSIGNEE(S): Intel Corporation, USA*
*SOURCE: PCT Int. Appl., 64 pp.*
*CODEN: PIXXD2*
*DOCUMENT TYPE: Patent*
*LANGUAGE: English*

*PATENT NO. KIND DATE APPLICATION NO. DATE*

*WO 2004031749 A2 20040415 WO 2003-US30997 20030930*
*WO 2004031749 A3 20040624*
*US 2004063214 A1 20040401 US 2002-262349 20020930*
*US 2004142484 A1 20040722 US 2003-675884 20030929*
*PRIORITY APPLN. INFO.: US 2002-262349 A 20020930*
*US 2003-675884 A 20030929*

*AB Spectroscopic anal. systems and methods for analyzing samples are disclosed. An anal. system contains an electromagnetic radiation source to provide radiation, a spectroscopic anal. chamber to perform a coherent Raman spectroscopy (e.g., stimulated Raman or coherent anti-Stokes Raman spectroscopy), and a radiation detector to detect radiation based on the spectroscopy. The chamber has a resonant cavity to contain a sample for anal., at least one window to the cavity to transmit the first radiation into the cavity and to transmit a second radiation out, a plurality of reflectors affixed to a housing of the cavity to reflect radiation of a predetd. frequency, the plurality of reflectors separated by a distance that is sufficient to resonate the radiation. The spectroscopic anal. system may be coupled with a nucleic acid sequencing system to receive a single nucleic acid derivative in solution and identify the derivative to sequence the nucleic acid.*

L1 ANSWER 5 OF 38 CAPLUS COPYRIGHT 2004 ACS on STN
ACCESSION NUMBER: 2003:937537 CAPLUS
DOCUMENT NUMBER: 140:171303
TITLE: "Enhanced-Raman scattering from silicon nanoparticle substrates"
AUTHOR(S): Liu, F. M.; Ren, B.; Wu, J. H.; Yan, J. W.; Xue, X. F.; Mao, B. W.; Tian, Z. Q.
CORPORATE SOURCE: State Key Laboratory for Physical Chemistry of Solid Surfaces and Department of Chemistry, Xiamen University, Xiamen, 361005, Peop. Rep. China
SOURCE: Chemical Physics Letters (2003), 382(5,6), 502-507
CODEN: CHPLBC; ISSN: 0009-2614
PUBLISHER: Elsevier Science B.V.
DOCUMENT TYPE: Journal
LANGUAGE: English

AB Raman enhancement effect of the electrochem. roughened Si substrate was studied with the excitation lines of 632.8 and 514.5 nm. Two kinds of Raman enhancement effects contributing to the overall Raman signal on the roughened Si surfaces were found: the electromagnetic cavity resonance effect occurring on the particles at the submicron scale, and the resonant Raman effect occurring on the particles at the nanometer scale. The originally extremely weak 4th-order multiphonon band was detected easily from the Si nano-/micro-structures assisted by these enhancements.
REFERENCE COUNT: 24

L1 ANSWER 6 OF 38 CAPLUS COPYRIGHT 2004 ACS on STN
ACCESSION NUMBER: 2003:690424 CAPLUS

DOCUMENT NUMBER: 140:101128
TITLE: Optical spectroscopy studies of single layers and superstructures of porous silicon
AUTHOR(S): Mattei, Giorgio
CORPORATE SOURCE: Istituto di Metodologie Inorganiche e dei Plasmi, (IMAI) Area della Ricerca di Roma 1, CNR-IMIP, Rome, 00016, Italy
SOURCE: GNSR 2001, State of Art and Future Development in Raman Spectroscopy and Related Techniques, Reggio Calabria, Italy, May 14-16, 2001 (2002), Meeting Date 2001, 147-164. Editor(s): Messina, Giacomo; Santangelo, Saveria. IOS Press: Amsterdam, Neth.
CODEN: 69EKX8; ISBN: 1-58603-262-3
DOCUMENT TYPE: Conference; General Review
LANGUAGE: English
AB A review. After a brief introduction describing the main properties of porous Si (PS) that have attracted a great interest in view of possible applications in several scientific and technol. fields, some recent studies by optical spectroscopies (Raman, IR, SHG) on PS systems, carried on by the authors' group and collaborators, are reviewed. In the 1st part, dedicated to the study of single layers of PS, the spectra obtained by micro-Raman spectroscopy from some thin mesoporous samples at different laser power are reported. The thermal effects induced by the laser heating are discussed and it is possible to evaluate, among other things, the thermal conductivity of the measured PS material. By FTIR reflection spectroscopy the oxidation processes of PS in humid air with and without pyridine vapor were studied. The main results are the description of the time evolution of the oxidation processes and the discovery of the catalytic role played by the organic base that accelerates the oxidation owing mainly to the H2O present in the air. In the 2nd part, concerning the works on PS superstructures (stacks of PS layers of different thickness and dielec. function), the study by FTIR spectroscopy of the dispersion of cavity-polaritons, due to the interaction of the Si-H absorption bands with the cavity mode in a PS Fabry-Perot is presented. Finally the enhancement of some order of magnitude of the signal (IR, Raman and SHG) in PS Fabry-Perot systems, due to the elec. field confinement in the cavity and to the resonance with the incident and/or the emitted light, is reported and discussed. REFERENCE COUNT: 58

L1 ANSWER 7 OF 38 CAPLUS COPYRIGHT 2004 ACS on STN
ACCESSION NUMBER: 2003:440819 CAPLUS
DOCUMENT NUMBER: 139:204640
TITLE: Collective sideband cooling in an optical ring cavity
AUTHOR(S): Elsasser, Th.; Nagorny, B.; Hemmerich, A.
CORPORATE SOURCE: Institut fur Laser-Physik, Universitat Hamburg, Hamburg, D-22761, Germany
SOURCE: Physical Review A: Atomic, Molecular, and Optical Physics (2003), 67(5), 051401/1-051401/4
CODEN: PLRAAN; ISSN: 1050-2947
PUBLISHER: American Physical Society
DOCUMENT TYPE: Journal
LANGUAGE: English

AB We propose a cavity-based laser-cooling and trapping scheme, providing tight confinement and cooling to very low temps., without degradation at high particle densities. A bidirectionally pumped ring cavity builds up a resonantly enhanced optical standing wave that acts to confine polarizable particles in deep potential wells. The particle localization yields a coupling of the degenerate traveling wave modes via coherent photon redistribution. This induces a splitting of the cavity resonances with a high-frequency component, which is tuned to the anti-Stokes Raman sideband of the particles oscillating in the potential wells, yielding cooling due to excess anti-Stokes scattering. REFERENCE COUNT: 14

L1 ANSWER 8 OF 38 CAPLUS COPYRIGHT 2004 ACS on STN
ACCESSION NUMBER: 2003:418020 CAPLUS
DOCUMENT NUMBER: 139:14685
TITLE: Multi-wavelength Raman fiber laser
INVENTOR(S): Deminov, Andrey A.; Starodoumov, Andrei N.; Po, Hong; Li, Xiaojun
PATENT ASSIGNEE(S): Optical Power Systems Inc., USA
SOURCE: PCT Int. Appl., 48 pp.
CODEN: PIXXD2
DOCUMENT TYPE: Patent
LANGUAGE: English

| PATENT NO. | KIND | DATE | APPLICATION NO. | DATE |
|---|---|---|---|---|
| WO 2003044914 | A1 | 20030530 | WO 2002-US36871 | 20021118 |
| WO 2003044914 | C1 | 20040401 | | |

PRIORITY APPLN. INFO.: US 2001-333813P P 20011116
AB A Raman fiber laser system is described comprising an energy source having at a wavelength <SYM108>p; an optical fiber containing a gain medium having a Raman active material, the optical fiber being configured to optically couple with the energy source; and a plurality of reflectors and output couplers disposed in the optical fiber, possibly forming optical cavities in the optical fiber, each optical cavity having a unique resonance wavelength, and at least two of the optical cavities do not overlap with each other in the optical fiber; wherein when the optical fiber receives energy at <SYM108>p, the optical fiber generates energy at <SYM108>1, <SYM108>2, <SYM108>3, and <SYM108>4, corresponding to the resonance wavelength of a first and other optical cavities resp. A fiber amplifier is also described comprising the Raman fiber laser system; and a second optical fiber configured to waveguide an optical signal and to receive energy from the Raman fiber laser system, wherein during operation of the fiber amplifier, energy from the Raman fiber laser amplifies the intensity of the optical signal waveguided by the second optical fiber. A communication system is also described comprising the Raman fiber laser system; and an optical fiber span, configured to waveguide an optical signal from a source location to a destination location, and configured to receive energy from the Raman fiber laser system.
REFERENCE COUNT: 3

L1 ANSWER 9 OF 38 CAPLUS COPYRIGHT 2004 ACS on STN
ACCESSION NUMBER: 2003:56120 CAPLUS

DOCUMENT NUMBER: 138:114753
TITLE: Raman cascade light sources
INVENTOR(S): Grudinin, Anatoly B.; Nilsson, Johan
PATENT ASSIGNEE(S): University of Southampton, UK
SOURCE: Eur. Pat. Appl., 47 pp.
CODEN: EPXXDW
DOCUMENT TYPE: Patent

| PATENT NO. | KIND | DATE | APPLICATION NO. | DATE |
|---|---|---|---|---|
| EP 1278279 | A1 | 20030122 | EP 2001-306189 | 20010718 |
| US 2003021302 | A1 | 20030130 | US 2002-193149 | 20020712 |

PRIORITY APPLN. INFO.: EP 2001-306189 A 20010718
US 2001-306406P P 20010720

AB A light source is described comprising (a) a pump source operable to emit a pump beam at a pump wavelength; (b) an input waveguide arranged to receive the pump beam from the pump source; (c) a wavelength selective coupler connected to the input waveguide; (d) a ring waveguide connected to the input waveguide by the wavelength selective coupler, the wavelength selective coupler being formed so as to receive at least a part of the pump beam into the ring waveguide, the ring waveguide having at least a portion that is phosphosilicate so as to Raman scatter the pump beam from the pump wavelength to a gain wavelength that is offset from the pump wavelength by a first Raman step of 1300-1400 cm-1, wherein the wavelength selective coupler is further formed to retain light at the gain wavelength in the ring waveguide, thereby to form a resonant cavity at the gain wavelength for producing Raman gain in the ring waveguide at the gain wavelength; and (e) an output waveguide connected to the ring waveguide by the wavelength selective coupler, the wavelength selective coupler being still further formed to couple out from the ring waveguide, as an emission beam, light at an emission wavelength that is offset by a second Raman step from the gain wavelength. A method of generating an emission beam is described entailing (a) inputting a pump beam at a pump wavelength into a ring waveguide comprising phosphosilicate; (b) down-converting the pump beam by a first Raman step of 1300-1400 cm-1 to form a gain beam having a gain wavelength at which the ring waveguide forms a resonant cavity at the gain wavelength to provide gain; (c) down-converting the gain beam to the emission wavelength by a second Raman step; and (d) coupling out from the ring waveguide a proportion of light at the emission wavelength to deliver the emission beam. REFERENCE COUNT: 5

L1 ANSWER 10 OF 38 CAPLUS COPYRIGHT 2004 ACS on STN
ACCESSION NUMBER: 2002:649432 CAPLUS
DOCUMENT NUMBER: 137:160753
TITLE: Matrix isolation resonance Raman and cavity ringdown spectroscopy of species of astrophysical interest
AUTHOR(S): Fuller, Jason Frank
CORPORATE SOURCE: Univ. of Florida, Gainesville, FL, USA
SOURCE: (2001) 85 pp. Avail.: UMI, Order No. DA3027517
From: Diss. Abstr. Int., B 2002, 62(10), 4563
DOCUMENT TYPE: Dissertation

LANGUAGE: English
AB Unavailable

L1 ANSWER 11 OF 38 CAPLUS COPYRIGHT 2004 ACS on STN
ACCESSION NUMBER: 2002:457196 CAPLUS
DOCUMENT NUMBER: 137:285729
TITLE: Optical double resonance of electronic Raman scattering in an AlAs-AlGaAs microcavity
AUTHOR(S): Kipp, T.; Rolf, L.; Schuller, C.; Endler, D.; Heyn, Ch.; Heitmann, D.
CORPORATE SOURCE: Institut fur Angewandte Physik und Zentrum fur Mikrostrukturforschung, Universitat Hamburg, Hamburg, D-20355, Germany
SOURCE: Physica E: Low-Dimensional Systems & Nanostructures (Amsterdam, Netherlands) (2002), 13(2-4), 408-411
CODEN: PELNFM; ISSN: 1386-9477
PUBLISHER: Elsevier Science B.V.
DOCUMENT TYPE: Journal
LANGUAGE: English
AB The authors report on Raman scattering by electronic intersubband excitations of a modulation-doped GaAs-Al0.2Ga0.8As quantum well embedded inside an AlAs-Al0.4Ga0.6As planar <SYM108> microcavity. In optical double-resonance conditions, i.e., when both the exciting laser and the scattered light are in resonance with the cavity, the excitations are exptl. enhanced by a factor of 1500 compared to single-resonant case. In a model calcn., a good agreement between theory and experiment were found.
REFERENCE COUNT: 6

L1 ANSWER 12 OF 38 CAPLUS COPYRIGHT 2004 ACS on STN
ACCESSION NUMBER: 2002:409715 CAPLUS
DOCUMENT NUMBER: 137:69813
TITLE: Stimulated Raman scattering in nanorod silicon carbide films
AUTHOR(S): Zhang, Hong-tao; Xu, Zhong-yang
CORPORATE SOURCE: Dept. of Electronics Science and Technology, Huazhong University of Science and Technology, Wuhan, 430074, Peop. Rep. China
SOURCE: Semiconductor Photonics and Technology (2002), 8(1), 32-36
CODEN: SPTEF9; ISSN: 1007-0206
PUBLISHER: Semiconductor Photonics and Technology
DOCUMENT TYPE: Journal
LANGUAGE: English
AB When the film is excited by a very low excitation energy, the spontaneous Raman scattering emerges. The intensity of Raman scattering is proportional to the excitation power below the threshold excitation. When the excited power reaches the excitation threshold, the intensity of Stokes light strongly increases. Meanwhile an anti-Stokes light at 495 nm and multiple order but small Stokes peaks occur. The intensity of Stokes light is much larger than that of anti-Stokes. The full width of half maximum (FWHM) of Stokes peak is reduced from 0.4 to <0.2 nm, the scattering angle between both Stokes and incident lights becomes <1°, and the angle between the Stokes and anti-Stokes lights is .apprx.3°. When the exciting power is in excess of the threshold, anti-Stokes and

multiple Raman scattering peaks reappear. These expts. can be unlimitedly repeated. From this experiment, the possibility of spontaneous Raman scattering is excluded. Probably the nanorods are a quantum line dimension having a large surface. There will be Raman differential scattering section so long as the nanorod films become strong scattering media; the surface-enhanced Raman scattering will be produced, the nanorod films, of SiC will form a strong multiple scattering resonance cavities so as to form the stimulated Raman scattering oscillation. REFERENCE COUNT: 8

L1 ANSWER 13 OF 38 CAPLUS COPYRIGHT 2004 ACS on STN
ACCESSION NUMBER: 2001:661760 CAPLUS
DOCUMENT NUMBER: 135:233602
TITLE: Multiple stage optical fiber amplifier
INVENTOR(S): Fidric, Bernard G.; Grubb, Stephen G.; Welch, David F.
PATENT ASSIGNEE(S): JDS Uniphase Corporation, USA
SOURCE: PCT Int. Appl., 38 pp.
CODEN: PIXXD2
DOCUMENT TYPE: Patent
LANGUAGE: English

| PATENT NO. | KIND | DATE | APPLICATION NO. | DATE |
|---|---|---|---|---|
| WO 2001065646 | A2 | 20010907 | WO 2001-US6406 | 20010227 |
| WO 2001065646 | A3 | 20020418 | | |

PRIORITY APPLN. INFO.: US 2000-515755 A 20000229
AB Multiple stage optical amplifiers are described which include a Raman fiber amplifier first stage coupled to a rare earth doped fiber amplifier which provides a second amplifier stage. Pump energy may be used to counter-propagate through a Raman first amplifier stage. Resonant pumping may also be used, including a cascaded Raman resonator type arrangement that encompasses a rare-earth doped gain medium. Methods of operating the amplifiers are also described.

L1 ANSWER 14 OF 38 CAPLUS COPYRIGHT 2004 ACS on STN
ACCESSION NUMBER: 2001:236744 CAPLUS
DOCUMENT NUMBER: 135:67813
TITLE: Algebraic method for solving a class of coupled-channel cavity QED models
AUTHOR(S): Wu, Ying; Yang, Xiaoxue
CORPORATE SOURCE: Physics Department, Huazhong University of Science and Technology, Wuhan, 430074, Peop. Rep. China
SOURCE: Physical Review A: Atomic, Molecular, and Optical Physics (2001), 63(4), 043816/1-043816/5
CODEN: PLRAAN; ISSN: 1050-2947
PUBLISHER: American Physical Society
DOCUMENT TYPE: Journal
LANGUAGE: English
AB A class of coupled-channel cavity QED models describing 2-photon resonant Raman processes in multiple-<SYM76> configuration are solved anal. by an algebraic method that introduces an angular momentum algebra for this multiwave mixing system.

REFERENCE COUNT: 34

L1 ANSWER 15 OF 38 CAPLUS COPYRIGHT 2004 ACS on STN
ACCESSION NUMBER: 2001:189869 CAPLUS
DOCUMENT NUMBER: 135:26341
TITLE: "Raman scattering in strongly coupled organic semiconductor microcavities"
AUTHOR(S): *Tartakovskii, A. I.; Emam-Ismail, M.; Lidzey, D. G.; Skolnick, M. S.; Bradley, D. D. C.; Walker, S.; Agranovich, V. M.*
CORPORATE SOURCE: Institute of Solid State Physics, Russian Academy of Sciences, Chernogolovka, 142432, Russia
SOURCE: **Physical Review B: Condensed Matter and Materials Physics (2001), 63(12), 121302/1-121302/4**
CODEN: PRBMDO; ISSN: 0163-1829
PUBLISHER: American Physical Society
DOCUMENT TYPE: Journal
LANGUAGE: English
AB The authors report the observation of resonant Raman scattering in the strong coupling regime for a planar microcavity containing cyanine dye J aggregates. The giant Rabi splitting between the polariton branches, resulting from the very large exciton oscillator strengths, allows the observation of doubly resonant Raman scattering where both incident and scattered photons are in resonance with the mixed exciton-cavity-mode states. Under double resonance conditions the Raman signals are very significantly enhanced, by factors up to 300, relative to noncavity organic films.
REFERENCE COUNT: 22

L1 ANSWER 16 OF 38 CAPLUS COPYRIGHT 2004 ACS on STN
ACCESSION NUMBER: 2000:698101 CAPLUS
DOCUMENT NUMBER: 134:22753
TITLE: "Raman scattering enhancement by optical confinement semiconductor planar microcavities"
AUTHOR(S): *Jusserand, B.; Fainstein, A.*
CORPORATE SOURCE: Concepts and Devices for Photonics (CDP) Lab, Bagneux, 92220, Fr.
SOURCE: **Springer Series in Materials Science (2000), 42(Raman Scattering in Materials Science), 148-150**
CODEN: SSMSE2; ISSN: 0933-033X
PUBLISHER: Springer-Verlag
DOCUMENT TYPE: Journal; General Review
LANGUAGE: English
AB A review with 6 refs. on cavity-enhanced Raman scattering in semiconductor heterostructures. Raman spectra of multiple InAs quantum wells embedded in a microcavity are used to illustrate the high spectral selectivity and the strong enhancement. REFERENCE COUNT: 6

L1 ANSWER 19 OF 38 CAPLUS COPYRIGHT 2004 ACS on STN
ACCESSION NUMBER: 1999:597805 CAPLUS

DOCUMENT NUMBER: 131:235420
TITLE: Resonant Raman scattering in semiconductor microcavities
AUTHOR(S): Fainstein, A.; Jusserand, B.; Andre, R.; Thierry-Mieg, V.
CORPORATE SOURCE: Centro Atomico Bariloche, CNEA, S. C. de Bariloche, 8400, Argent.
SOURCE: Physica Status Solidi B: Basic Research (1999), 215(1), 403-407
CODEN: PSSBBD; ISSN: 0370-1972
PUBLISHER: Wiley-VCH Verlag Berlin GmbH
DOCUMENT TYPE: Journal
LANGUAGE: English
AB We present 1st-order resonant Raman scattering results on III-V and II-VI semiconductor QW embedded planar microcavities, as a function of both laser incidence angle and cavity-exciton detuning. We show that the results can be well described by a simple expression for the scattering efficiency, <SYM115>pol <SYM181> (SpiSxi) (SppsSxs), where Sp and Sx are the photonic and excitonic strength, resp., of the incoming and scattered cavity polaritons. We discuss the assumptions leading to this expression in terms of existing theories of polariton-mediated scattering in bulk, adapted to optically confined structures. REFERENCE COUNT: 7

L1 ANSWER 20 OF 38 CAPLUS COPYRIGHT 2004 ACS on STN
ACCESSION NUMBER: 1998:484404 CAPLUS
DOCUMENT NUMBER: 129:322957
TITLE: Cavity polariton resonant Raman scattering in III-V and II-VI microcavities
AUTHOR(S): Fainstein, A.; Jusserand, B.; Thierry-Mieg, V.; Andre, R.
CORPORATE SOURCE: Centro Atomico Bariloche, S.C. de Bariloche, Argent.
SOURCE: Physica E: Low-Dimensional Systems & Nanostructures (Amsterdam) (1998), 2(1-4), 829-833
CODEN: PELNFM; ISSN: 1386-9477
PUBLISHER: Elsevier Science B.V.
DOCUMENT TYPE: Journal
LANGUAGE: English
AB We report on the observation by Raman scattering of the strong resonance enhancement of the inelastic light scattering in both II-VI and III-V semiconductor microcavities when the laser energy becomes close to the cavity polariton energy. We discuss which exptl. observations can be simply explained within the usual excitonic picture for light scattering or unambiguously reflect polariton mediation. We describe the later within a simple model based on the available theories for bulk polariton mediated Raman scattering. REFERENCE COUNT: 7

L1 ANSWER 21 OF 38 CAPLUS COPYRIGHT 2004 ACS on STN
ACCESSION NUMBER: 1997:796405 CAPLUS
DOCUMENT NUMBER: 128:55048
TITLE: Optical and polaritonic resonances in Raman scattering on semiconductor microcavities
AUTHOR(S): Fainstein, A.; Jusserand, B.; Thierry-Mieg, V.; Andre, R.
CORPORATE SOURCE: Centro Atomico, S. C. Bariloche, Bariloche, Argent.

SOURCE: Physica Status Solidi A: Applied Research (1997), 164(1), 53-59
CODEN: PSSABA; ISSN: 0031-8965
PUBLISHER: Akademie Verlag GmbH
DOCUMENT TYPE: Journal
LANGUAGE: English
AB Single and double optical resonant Raman scattering is demonstrated in semiconductor microcavities. Its evolution towards excitonic resonance was studied in microcavities containing a few quantum wells of either III-V or II-VI materials and displaying strong coupling. The light scattering process then relies on cavity polaritons as intermediate steps of the inelastic scattering.

L1 ANSWER 22 OF 38 CAPLUS COPYRIGHT 2004 ACS on STN
ACCESSION NUMBER: 1997:753329 CAPLUS
DOCUMENT NUMBER: 128:94731
TITLE: "In- and out-going resonant Raman scattering from the cavity polaritons of semiconductor quantum microcavities"
AUTHOR(S): *Tribe, W. R.; Baxter, D.; Skolnick, M. S.; Mowbray, D. J.; Fisher, T. A.; Roberts, J. S.*
CORPORATE SOURCE: Department of Physics, University of Sheffield, Sheffield, S3 7RH, UK
SOURCE: **Physical Review B: Condensed Matter (1997), 56(19), 12429-12433**
CODEN: PRBMDO; ISSN: 0163-1829
PUBLISHER: American Physical Society
DOCUMENT TYPE: Journal
LANGUAGE: English
AB The authors present a resonant Raman scattering study of an on-resonance semiconductor quantum microcavity. Clear evidence for polariton mediation of the resonant Raman process in a microcavity is obtained. Two resonant peaks are observed in the out-going channel, arising from the upper and lower resonantly coupled exciton-photon (polariton) modes of the system. The resonant enhancement from the upper polariton state is much weaker than that of the lower state, due to the shorter dephasing time of the former. In the in-going channel, by contrast, only a single resonant peak is observed The authors interpret this as arising from the much larger carrier d. created by the photoexcitation, which for the in-going case is resonant in energy with the polariton states. The high carrier d. leads to screening of the excitons, and decoupling of the excitonic and photonic states. REFERENCE COUNT: 18

L1 ANSWER 23 OF 38 CAPLUS COPYRIGHT 2004 ACS on STN
ACCESSION NUMBER: 1997:729823 CAPLUS
DOCUMENT NUMBER: 128:67876
TITLE: Raman scattering photonic and polaritonic resonances in semiconductor microcavities
AUTHOR(S): Jusserand, B.; Fainstein, A.
CORPORATE SOURCE: CNET/Laboratoire de Bagneux, Bagneux, 92225, Fr.
SOURCE: Acta Physica Polonica, A (1997), 92(4), 685-693
CODEN: ATPLB6; ISSN: 0587-4246

PUBLISHER: Polish Academy of Sciences, Institute of Physics
DOCUMENT TYPE: Journal
LANGUAGE: English
AB Single and double optical resonant Raman scattering is demonstrated in semiconductor microcavities. Its evolution towards excitonic ingoing resonance relies on cavity-polaritons as intermediated steps of the inelastic scattering. Implications for high-sensitivity spectroscopy and low-power stimulated processes are emphasized.
REFERENCE COUNT: 9

L1 ANSWER 24 OF 38 CAPLUS COPYRIGHT 2004 ACS on STN
ACCESSION NUMBER: 1997:609005 CAPLUS
DOCUMENT NUMBER: 127:285095
TITLE: Generation of multi-atom entangled states via the Raman atom-cavity-field interaction
AUTHOR(S): Zheng, Shi-Biao; Guo, Guang-Can
CORPORATE SOURCE: Department of Physics and Nonlinear Science Center, University of Science and Technology of China, Hefei, 230026, Peop. Rep. China
SOURCE: Chinese Physics Letters (1997), 14(7), 485-487
CODEN: CPLEEU; ISSN: 0256-307X
PUBLISHER: Chinese Physical Society
DOCUMENT TYPE: Journal
LANGUAGE: English
AB A scheme is presented for preparing multi-atom entangled states based on the Raman atom-cavity-field interaction. After several degenerate <SYM76>-type three-level atoms interact with an appropriately prepared single-mode cavity field through Raman coupling, a two-level atom, resonant with the cavity, is sent through the cavity and a Ramsey zone. The detection of the two-level atom leaves the <SYM76>-type atoms in an entangled state. REFERENCE COUNT: 10

L1 ANSWER 25 OF 38 CAPLUS COPYRIGHT 2004 ACS on STN
ACCESSION NUMBER: 1997:335981 CAPLUS
DOCUMENT NUMBER: 127:101111
TITLE: Raman scattering from optically levitated microdroplets: influence of input resonances on output resonances
AUTHOR(S): Popp, J.; Hartmann, I.; Lankers, M.; Trunk, M.; Kiefer, W.
CORPORATE SOURCE: Inst. Physikalische Chemie, Univ. Wurzburg, Wurzburg, D-97074, Germany
SOURCE: Berichte der Bunsen-Gesellschaft (1997), 101(5), 809-813
CODEN: BBPCAX; ISSN: 0940-483X
PUBLISHER: VCH
DOCUMENT TYPE: Journal
LANGUAGE: English
AB We consider the influence of input resonances (incident electromagnetic field is in resonance with the cavity) on the output resonances in Raman spectra (scattered Raman field is in resonance with the cavity) of optically levitated microdroplets. Dependent on the kind of input resonance the output resonances show spectral shifts. These shifts are

the result of a temperature increase, due to an input resonance and weak absorbance of the microparticle. The dependence of these temperature increases on the kind of input resonance is described. In the experiment, the 514.5 nm line of an argon ion laser was used for both optical levitation and Raman excitation of a glycerol droplet of radius .apprx.10 <SYM109>m. Several morphol. dependent resonances (MDR) were superimposed on the OH-stretching signal. The time dependent radius and refractive indexes were determined. REFERENCE COUNT: 13

L1 ANSWER 26 OF 38 CAPLUS COPYRIGHT 2004 ACS on STN
ACCESSION NUMBER: 1997:141379 CAPLUS
DOCUMENT NUMBER: 126:298825
TITLE: "Cavity-polariton mediated resonant Raman scattering"
AUTHOR(S): *Fainstein, A.; Jusserand, B.; Thierry-Mieg, V.*
CORPORATE SOURCE: France Telecom, PAB-Lab. Bagneux, Bagneux, 92225, Fr.
SOURCE: **Physical Review Letters (1997), 78(8), 1576-1579**
CODEN: PRLTAO; ISSN: 0031-9007
PUBLISHER: American Physical Society
DOCUMENT TYPE: Journal
LANGUAGE: English
AB The authors present resonant Raman scattering results in planar semiconductor microcavities in the cavity polariton regime. The authors demonstrate resonant enhancement of both exciton and cavity-photon nature. Evidence of cavity-polariton mediation of the scattering process was obtained from the angular dependence of the resonant Raman intensity. A single peak at the exciton energy is observed in incoming resonance scans, showing that scattering also occurs through weakly coupled localized excitons as intermediate steps.

L1 ANSWER 27 OF 38 CAPLUS COPYRIGHT 2004 ACS on STN
ACCESSION NUMBER: 1995:634734 CAPLUS
DOCUMENT NUMBER: 123:21719
TITLE: Laser wavelength-modulating apparatus
INVENTOR(S): Tashiro, Hideo; Tsunemi, Akira
PATENT ASSIGNEE(S): Rikagaku Kenkyuzyo, Japan
SOURCE: Jpn. Kokai Tokkyo Koho, 11 pp.
CODEN: JKXXAF
DOCUMENT TYPE: Patent
LANGUAGE: Japanese
PATENT NO. KIND DATE APPLICATION NO. DATE
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JP 07099374 A2 19950411 JP 1993-262905 19930927
JP 2759745 B2 19980528
PRIORITY APPLN. INFO.: JP 1993-262905 19930927
AB The apparatus, suitable for use in the UF6 isotope separation, comprises a CO2 pump laser; and a Raman resonance cavity cell containing para H2.

L1 ANSWER 28 OF 38 CAPLUS COPYRIGHT 2004 ACS on STN

ACCESSION NUMBER: 1995:431604 CAPLUS
DOCUMENT NUMBER: 122:277274
TITLE: Squeezing from Raman scattering in optical parametric oscillators
AUTHOR(S): Garcia-Fernandez, P.; Zhou, Peng
CORPORATE SOURCE: Instituto de Estructura de la Materia, CSIC, Madrid, 28006, Spain
SOURCE: Journal of Modern Optics (1994), 41(12), 2259-73
CODEN: JMOPEW; ISSN: 0950-0340
DOCUMENT TYPE: Journal
LANGUAGE: English
AB The squeezing properties of the Raman scattering process which takes place when the lower output frequency from a nondegenerate optical parametric interaction approaches a resonance of the nonlinear medium placed inside an optical resonant cavity are presented. The linear stability anal. was performed and the spectrum for the output fields is given in terms of the quadrature phase components in the Wigner representation. Perfect squeezing for the amplitude difference between the output Stokes and anti-Stokes modes at the Hopf bifurcation point was obtained.

L1 ANSWER 29 OF 38 CAPLUS COPYRIGHT 2004 ACS on STN
ACCESSION NUMBER: 1993:505043 CAPLUS
DOCUMENT NUMBER: 119:105043
TITLE: Cavity-field-assisted atomic relaxation and suppression of resonance fluorescence at high intensities
AUTHOR(S): Gangopadhyay, Gautam; Basu, Samita; Ray, Deb Shankar
CORPORATE SOURCE: Dep. Phys. Chem., Indian Assoc. Cultiv. Sci., Calcutta, 700 032, India
SOURCE: Physical Review A: Atomic, Molecular, and Optical Physics (1993), 47(2), 1314-19
CODEN: PLRAAN; ISSN: 0556-2791
DOCUMENT TYPE: Journal
LANGUAGE: English
AB Within the framework of the cavity QED model a cavity-field-assisted dissipation process via a Raman-type coupling of the atom- cavity system (under off-resonance conditions) to a reservoir are considered. At higher applied field strength the Mollow triplet gets significantly suppressed due to this cavity-field-dependent atomic relaxation.

L1 ANSWER 30 OF 38 CAPLUS COPYRIGHT 2004 ACS on STN
ACCESSION NUMBER: 1987:645538 CAPLUS
DOCUMENT NUMBER: 107:245538
TITLE: "Spherical resonant cavity. II. Raman oscillation within the spherical cavity"
AUTHOR(S): *Qian, Shixiong*
CORPORATE SOURCE: Phys. Dep., Fudan Univ., Shanghai, Peop. Rep. China
SOURCE: **Guangxue Xuebao (1987), 7(8), 690-6**
CODEN: GUXUDC; ISSN: 0253-2239
DOCUMENT TYPE: Journal
LANGUAGE: Chinese

AB A comparison is made between the spherical resonant cavity and Fabry-Perot cavity. The Raman oscillation within the spherical cavity which includes the oscillation spectra of water and ethanol droplets and the field distribution inside the droplets are discussed. Both the output resonance and input resonance were observed in the experiment and are discussed. The high-order Stokes oscillation and the combination Stokes oscillation in the liquid droplets were also observed.

L1 ANSWER 33 OF 38 CAPLUS COPYRIGHT 2004 ACS on STN
ACCESSION NUMBER: 1986:26269 CAPLUS
DOCUMENT NUMBER: 104:26269
TITLE: Resonant electric field enhancement in the vicinity of a bare metallic grating exposed to s-polarized light
AUTHOR(S): Maradudin, A. A.; Wirgin, A.
CORPORATE SOURCE: Dep. Phys., Univ. California, Irvine, CA, 92717, USA
SOURCE: Surface Science (1985), 162(1-3), 980-4
CODEN: SUSCAS; ISSN: 0039-6028
DOCUMENT TYPE: Journal
LANGUAGE: English
AB s-Polarized light striking a Ag lamellar grating gives rise to cavity resonances (in the grooves) which do not show up by well-defined features (anomalies) in the reflectivity spectrum. These resonances do, however, manifest themselves by significant elec. field enhancements within the grooves which could be detected by adsorbed mols. producing Raman-Stokes radiation.

L1 ANSWER 34 OF 38 CAPLUS COPYRIGHT 2004 ACS on STN
ACCESSION NUMBER: 1985:211854 CAPLUS
DOCUMENT NUMBER: 102:211854
TITLE: Resonant enhancement of the electric field in the grooves of bare metallic gratings exposed to S-polarized light
AUTHOR(S): Wirgin, A.; Maradudin, A. A.
CORPORATE SOURCE: Lab. Mec. Theor., Univ. Paris VI, Paris, F-75230/05, Fr.
SOURCE: Physical Review B: Condensed Matter and Materials Physics (1985), 31(8), 5573-6
CODEN: PRBMDO; ISSN: 0163-1829
DOCUMENT TYPE: Journal
LANGUAGE: English
AB Cavity resonances are produced for S-polarized light striking an infinitely conducting lamellar grating. They manifest themselves by significant elec. field enhancements within the grooves. This result has applications to surface-enhanced Raman scattering.

L1 ANSWER 35 OF 38 CAPLUS COPYRIGHT 2004 ACS on STN
ACCESSION NUMBER: 1985:157174 CAPLUS
DOCUMENT NUMBER: 102:157174
TITLE: "On the natures of "SERS active sites""
AUTHOR(S): *Pettenkofer, C.; Eickmans, J.; Ertuerk, U.; Otto, A.*

CORPORATE SOURCE: Phys. Inst. III, Univ. Duesseldorf, Duesseldorf, D-4000/1, Fed. Rep. Ger.
SOURCE: **Surface Science (1985), 151(1), 9-36**
CODEN: SUSCAS; ISSN: 0039-6028
DOCUMENT TYPE: Journal
LANGUAGE: English
AB Active sites of short range enhancement in surface enhanced Raman scattering (SERS) of adsorbates on cold deposited, porous Ag films have been envisioned either as cavity sites with local electromagnetic resonances or as sites of atomic scale roughness with photon driven charge transfer between metal and adsorbate. Whereas SERS of CO and N2 is observed at low coverages, the Raman signal of physisorbed O2 is below the noise level, even at monolayer coverage of the internal surface or filling of the pores. SERS of ethylene and pyridine is quenched by some percent of a monolayer of O. The Raman signal of multilayer condensed O2 is stronger for a compact film than for a porous film. These observations cannot be reconciled with the 1st hypothesis, but they are consistent with the 2nd.

L1 ANSWER 36 OF 38 CAPLUS COPYRIGHT 2004 ACS on STN
ACCESSION NUMBER: 1982:431109 CAPLUS
DOCUMENT NUMBER: 97:31109
TITLE: Intracavity Raman frequency conversion in a high power laser
INVENTOR(S): Liu, Yung S.
PATENT ASSIGNEE(S): General Electric Co., USA
SOURCE: U.S., 7 pp.
CODEN: USXXAM
DOCUMENT TYPE: Patent
LANGUAGE: English
PATENT NO. KIND DATE APPLICATION NO. DATE
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US 4327337 A 19820427 US 1980-109359 19800103
PRIORITY APPLN. INFO.: US 1980-109359 19800103
AB A gaseous Raman conversion medium is placed inside a laser resonant cavity to generate tunable laser radiation in the visible, near- and far-IR spectral ranges with an improved conversion efficiency and a higher power output. The combination of the laser medium, a gaseous Raman medium and nonlinear sum and difference generation using intracavity conversion produces coherent radiation at a frequency distinct from the frequency emitted by the laser medium. This new frequency is coupled out of the cavity as the desired output.

L1 ANSWER 37 OF 38 CAPLUS COPYRIGHT 2004 ACS on STN
ACCESSION NUMBER: 1980:434254 CAPLUS
DOCUMENT NUMBER: 93:34254
TITLE: "Use of the Raman microprobe for thin film spectroscopy"
AUTHOR(S): *Royer, H.; Dupeyrat, R.*
CORPORATE SOURCE: Dep. Rech. Phys., Univ. Pierre et Marie Curie, Paris, 75230, Fr.

SOURCE: **Actualite Chimique (1980), (4), 67-9**
CODEN: ACCHDG; ISSN: 0151-9093
DOCUMENT TYPE: Journal
LANGUAGE: French
AB Raman spectroscopy is one of the techniques used to determine mol. structure in thin films. Raman microprobe enables one to measure the radiation scattered by films whose thickness is on the order of 10 nm. However, these measurements can only be performed where the film itself is used as a resonant cavity for the irradiation, or by utilizing the resonant Raman effect.

L1 ANSWER 38 OF 38 CAPLUS COPYRIGHT 2004 ACS on STN
ACCESSION NUMBER: 1968:17325 CAPLUS
DOCUMENT NUMBER: 68:17325
TITLE: "Mode pulling in a stimulated raman oscillator"
AUTHOR(S): Tannenwald, Peter E.
CORPORATE SOURCE: Massachusetts Inst. of Technol., Lexington, MA, USA
SOURCE: Journal of Applied Physics (1967), 38(12), 4788-90
CODEN: JAPIAU; ISSN: 0021-8979
DOCUMENT TYPE: Journal
LANGUAGE: English
AB Stimulated Raman scattering has been observed in quartz at low temps. in which the 467-cm.-1 Stokes line is split into two or more sharp components. The quartz samples, which were in the form of resonant cavities, behaved as Raman oscillators pumped by a ruby laser. Measurement of the Fabry-Perot mode spacings of the oscillators showed that substantial mode pulling was occurring. This was interpreted according to mode-pulling theory.

L5 ANSWER 1 OF 60 CAPLUS COPYRIGHT 2004 ACS on STN
ACCESSION NUMBER: 2004:759566 CAPLUS
DOCUMENT NUMBER: 141:221285
TITLE: "Chemical enhancement in surface enhanced Raman scattering using lithium salts"
INVENTOR(S): *Su, Xing; Sun, Lei; Koo, Tae-Woong; Chan, Selena*
PATENT ASSIGNEE(S): USA
SOURCE: U.S. Pat. Appl. Publ., 10 pp.
CODEN: USXXCO
DOCUMENT TYPE: Patent
LANGUAGE: English
PATENT NO. KIND DATE APPLICATION NO. DATE
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**US 2004179195** A1 20040916 US 2003-387080 20030312
PRIORITY APPLN. INFO.: US 2003-387080 20030312
AB Briefly, in accordance with one embodiment of the invention, the intensity of the signals from surface enhanced Raman spectroscopy may be increased by using lithium chloride as an enhancer to activate a metallic structure used for surface enhanced Raman spectroscopy. The increased signal intensity may allow surface enhanced Raman

spectroscopy to be utilized to detect individual analytes such as nucleotides, for example in DNA sequencing without requiring a dye or radioactive label.

L5 ANSWER 2 OF 60 CAPLUS COPYRIGHT 2004 ACS on STN
ACCESSION NUMBER: 2004:533793 CAPLUS
DOCUMENT NUMBER: 141:50138
TITLE: "Methods to increase nucleotide signals by Raman scattering"
INVENTOR(S): *Su, Xing; Berlin, Andrew A.; Chan, Selena; Kirch, Steven J.; Koo, Tae-Woong; Neubauer, Gabi; Rao, Valluri; Sundararajan, Narayanan; Yamakawa, Mineo*
PATENT ASSIGNEE(S): USA
SOURCE: U.S. Pat. Appl. Publ., 26 pp., Cont.-in-part of U.S. Ser. No. 99,287.
CODEN: USXXCO
DOCUMENT TYPE: Patent
LANGUAGE: English

| PATENT NO. | KIND | DATE | APPLICATION NO. | DATE |
|---|---|---|---|---|
| **US 2004126790** | A1 | 20040701 | US 2003-660902 | 20030912 |
| **US 2003186240** | A1 | 20031002 | US 2002-99287 | 20020314 |

PRIORITY APPLN. INFO.: US 2001-962555 A2 20010924
US 2002-99287 A2 20020314

AB The methods and apparatus disclosed herein concern nucleic acid sequencing by enhanced Raman spectroscopy. In certain embodiments of the invention, nucleotides are covalently attached to Raman labels before incorporation into a nucleic acid. In other embodiments, unlabeled nucleic acids are used. Exonuclease treatment of the nucleic acid results in the release of labeled or unlabeled nucleotides that are detected by Raman spectroscopy. In alternative embodiments of the invention, nucleotides released from a nucleic acid by exonuclease treatment are covalently cross-linked to nanoparticles and detected by surface enhanced Raman spectroscopy (SERS), surface enhanced resonance Raman spectroscopy (SERRS) and/or coherent anti-Stokes Raman spectroscopy (CARS). Other embodiments of the invention concern apparatus for nucleic acid sequencing.

L5 ANSWER 3 OF 60 CAPLUS COPYRIGHT 2004 ACS on STN
ACCESSION NUMBER: 2004:473230 CAPLUS
DOCUMENT NUMBER: 141:18718
TITLE: "Methods and device for DNA sequencing using Raman spectroscopy"
INVENTOR(S): *Chan, Selena; Su, Xing*
PATENT ASSIGNEE(S): USA
SOURCE: U.S. Pat. Appl. Publ., 23 pp., Cont.-in-part of U.S. Pat. Appl. 2003 187,237.
CODEN: USXXCO
DOCUMENT TYPE: Patent
LANGUAGE: English

| PATENT NO. | KIND | DATE | APPLICATION NO. | DATE |
|---|---|---|---|---|
| US 2004110208 | A1 | 20040610 | US 2003-672149 | 20030926 |
| **US 2003187237** | A1 | 20031002 | US 2002-108128 | 20020326 |

PRIORITY APPLN. INFO.: US 2002-108128 A2 20020326
AB The methods and apparatus disclosed herein concern nucleic acid characterization by enhanced Raman spectroscopy. In certain embodiments of the invention, exonuclease treatment of the nucleic acids results in the release of nucleotides. The nucleotides may pass from a reaction chamber through a microfluidic channel and enter a nanochannel or microchannel. The nanochannel or microchannel may be packed with nanoparticle aggregates containing hot spots for Raman detection. As the nucleotides pass through the nanoparticle hot spots, they may be detected by Raman spectroscopy. Identification of the sequence of nucleotides released from the nucleic acid is used to characterize the nucleic acid, for example by sequencing or identifying the nucleic acid. Other embodiments of the invention concern apparatus for nucleic acid sequencing.

L5 ANSWER 6 OF 60 CAPLUS COPYRIGHT 2004 ACS on STN
ACCESSION NUMBER: 2003:952916 CAPLUS
DOCUMENT NUMBER: 140:141982
TITLE: "Evaluation of surface-enhanced resonance raman scattering for quantitative DNA analysis"
AUTHOR(S): *Faulds, Karen; Smith, W. Ewen; Graham, Duncan*
CORPORATE SOURCE: Department of Pure and Applied Chemistry, University of Strathclyde, Glasgow, G1 1XL, UK
SOURCE: **Analytical Chemistry (2004), 76(2), 412-417**
CODEN: ANCHAM; ISSN: 0003-2700
PUBLISHER: American Chemical Society
DOCUMENT TYPE: Journal
LANGUAGE: English
AB The labeling of biol. species using dyes has become common practice to aid in their detection, and immediate pos. identification of specific dyes in high dilution is a key requirement. Here the detection by surface- enhanced resonance Raman scattering (SERRS) of eight com. available dye labels (ROX, rhodamine 6G, HEX, FAM, TET, Cy3, Cy5, TAMRA) attached to oligonucleotide strands is reported. Each of the eight labels was easily detected by using the SERRS from silver nanoparticles to produce a unique, molecularly specific spectrum. The conditions were optimized to obtain the best signal enhancement, and linear concentration graphs at low oligonucleotide concns. were obtained. At higher concns. (above .apprx.10-8 mol dm-3), curvature was introduced into the concentration graphs with the exception of rhodamine 6G, TET, and FAM, which gave linearity over the entire concentration range studied. Detection limits as low as 0.5 fmol were obtained, with lower possible if a smaller sample was analyzed. Investigation was also carried out into the effect of a Tris-HCl buffer containing the surfactant Tween 20 to aid in the prevention of surface adhesion of the oligonucleotides to the sample vessels at ultralow concns. The Tween 20 allowed lower detection limits to be obtained for each of the labels studied. This study shows that the different dyes commonly used with oligonucleotides can give quant. SERRS at concentration levels not possible when the same dyes are used with fluorescence detection. REFERENCE COUNT: 21

L5 ANSWER 7 OF 60 CAPLUS COPYRIGHT 2004 ACS on STN
ACCESSION NUMBER: 2003:777436 CAPLUS

DOCUMENT NUMBER: 139:256263
TITLE: Methods and device for DNA sequencing using Raman spectroscopy
INVENTOR(S): Chan, Selena; Su, Xing
PATENT ASSIGNEE(S): USA
SOURCE: U.S. Pat. Appl. Publ., 13 pp.
CODEN: USXXCO
DOCUMENT TYPE: Patent
LANGUAGE: English

| PATENT NO. | KIND | DATE | APPLICATION NO. | DATE |
|---|---|---|---|---|
| US 2003187237 | A1 | 20031002 | US 2002-108128 | 20020326 |
| US 2004110208 | A1 | 20040610 | US 2003-672149 | 20030926 |

PRIORITY APPLN. INFO.: US 2002-108128 A2 20020326

AB The methods and apparatus disclosed herein concern nucleic acid sequencing by enhanced Raman spectroscopy. In certain embodiments of the invention, exonuclease treatment of the nucleic acids 109 results in the release of nucleotides. The nucleotides may pass from a reaction chamber through a microfluidic channel and enter a nanochannel or microchannel. The nanochannel or microchannel may be packed with nanoparticle aggregates containing hot spots for Raman detection. As the nucleotides pass through the nanoparticle hot spots, they may be detected by surface enhanced Raman spectroscopy (SERS), surface enhanced resonance Raman spectroscopy (SERRS) and/or coherent anti-Stokes Raman spectroscopy (CARS). Identification of the sequence of nucleotides released from the nucleic acid provides the nucleic acid sequence. Other embodiments of the invention concern apparatus for nucleic acid sequencing.

L5 ANSWER 8 OF 60 CAPLUS COPYRIGHT 2004 ACS on STN
ACCESSION NUMBER: 2003:757874 CAPLUS
DOCUMENT NUMBER: 139:256255
TITLE: Methods and device for nucleic acid sequencing by detecting Raman labeled nucleotides cross-linked to silver or gold nanoparticles using Raman spectroscopy
INVENTOR(S): *Su, Xing; Berlin, Andrew; Koo, Tae-woong; Chan, Selena; Sundararajan, Narayan; Yamakawa, Mineo*
PATENT ASSIGNEE(S): Intel Corporation, USA
SOURCE: PCT Int. Appl., 35 pp.
CODEN: PIXXD2
DOCUMENT TYPE: Patent
LANGUAGE: English
FAMILY ACC. NUM. COUNT: 3

| PATENT NO. | KIND | DATE | APPLICATION NO. | DATE |
|---|---|---|---|---|
| WO 2003078649 | A2 | 20030925 | WO 2003-US7641 | 20030311 |
| WO 2003078649 | A3 | 20040422 | | |
| US 2003186240 | A1 | 20031002 | US 2002-99287 | 20020314 |

PRIORITY APPLN. INFO.: US 2002-99287 A 20020314

AB The methods and apparatus disclosed herein concern nucleic acid sequencing by enhanced Raman spectroscopy. In certain embodiments of the invention, nucleotides are covalently attached to Raman labels before incorporation into a nucleic acid (13). Exonuclease (15) treatment of the labeled nucleic acid (13) results in the release of labeled nucleotides (16, 130), which are detected by Raman spectroscopy. In alternative embodiments of the invention, nucleotides released from a nucleic acid by exonuclease treatment are covalently cross-linked to silver or gold nanoparticles and detected by surface enhanced Raman spectroscopy (SERS), surface enhanced resonance Raman spectroscopy (SERRS) and/or coherent anti-Stokes Raman spectroscopy (CARS).

L5 ANSWER 9 OF 60 CAPLUS COPYRIGHT 2004 ACS on STN
ACCESSION NUMBER: 2003:437025 CAPLUS
DOCUMENT NUMBER: 139:208339
TITLE: "Detection of DNA probes using Diels Alder cycloaddition and SERRS (Surface Enhanced Resonance Raman Scattering)"
AUTHOR(S): *Graham, Duncan; Fruk, Ljiljana; Ewen Smith, W.*
CORPORATE SOURCE: Department of Pure and Applied Chemistry, University of Strathclyde, Glasgow, G1 1XL, UK
SOURCE: **Analyst (Cambridge, United Kingdom) (2003), 128(6), 692-699**
CODEN: ANALAO; ISSN: 0003-2654
PUBLISHER: Royal Society of Chemistry
DOCUMENT TYPE: Journal
LANGUAGE: English
AB A number of methods for detecting specific DNA sequences have been used to provide data for use in diagnosis of disease states and examination of gene expression. This study shows how the use of labeled oligonucleotides created by Diels Alder cycloaddn. can be used as surface enhanced resonance Raman scattering (SERRS) active probes that provide easily identifiable signals at low concns. in a mixture The probes were produced by first tagging the oligonucleotides with a furan residue at the 5'-terminus to act as the diene. Three specifically designed benzotriazole azo maleimide dyes were then used as dienophiles to undergo cycloaddn. with the furan modified oligonucleotide to generate SERRS active probes. These probes gave excellent SERRS signals from a silver-PVA film. Surface mapping of the silver PVA film indicated that the distribution of the dyes was uniform and that the number of moles of probe detected at any one time was approx. in the attomole region. REFERENCE COUNT: 36

L5 ANSWER 10 OF 60 CAPLUS COPYRIGHT 2004 ACS on STN
ACCESSION NUMBER: 2003:262011 CAPLUS
DOCUMENT NUMBER: 138:249760
TITLE: "Methods for nucleic acid sequencing by Raman monitoring"
INVENTOR(S): *Rao, Valluri; Neubauer, Gabi; Kirch, Steven; Yamakawa, Mineo; Berlin, Andrew*
PATENT ASSIGNEE(S): Intel Corporation, USA
SOURCE: PCT Int. Appl., 30 pp.
CODEN: PIXXD2
DOCUMENT TYPE: Patent

LANGUAGE: English

| PATENT NO. | KIND | DATE | APPLICATION NO. | DATE |
|---|---|---|---|---|
| WO 2003027326 | A2 | 20030403 | WO 2002-US27610 | 20020830 |
| WO 2003027326 | A3 | 20031211 | | |

W: AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NO, NZ, OM, PH, PL, PT, RO, RU, SD, SE, SG, SI, SK, SL, TJ, TM, TN, TR, TT, TZ, UA, UG, UZ, VC, VN, YU, ZA, ZM, ZW, AM, AZ, BY, KG, KZ, MD, RU, TJ, TM

RW: GH, GM, KE, LS, MW, MZ, SD, SL, SZ, TZ, UG, ZM, ZW, AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE, SK, TR, BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG

EP 1430149 A2 20040623 EP 2002-757478 20020830

R: AT, BE, CH, DE, DK, ES, FR, GB, GR, IT, LI, LU, NL, SE, MC, PT, IE, SI, LT, LV, FI, RO, MK, CY, AL, TR, BG, CZ, EE, SK

PRIORITY APPLN. INFO.: US 2001-962555 A 20010924
WO 2002-US27610 W 20020830

AB The disclosed methods, apparatus and compns. are of use for nucleic acid sequencing. More particularly, the methods and apparatus concern sequencing single mols. of single stranded DNA or RNA by exposing the mol. to exonuclease activity, removing free nucleotides one at a time from one end of the nucleic acid, and identifying the released nucleotides by Raman spectroscopy or FRET.

L5 ANSWER 11 OF 60 CAPLUS COPYRIGHT 2004 ACS on STN
ACCESSION NUMBER: 2002:843742 CAPLUS
DOCUMENT NUMBER: 138:250913
TITLE: A novel amplification mechanism for surface enhanced Raman scattering
AUTHOR(S): Etchegoin, P.; Liem, H.; Maher, R. C.; Cohen, L. F.; Brown, R. J. C.; Hartigan, H.; Milton, M. J. T.; Gallop, J. C.
CORPORATE SOURCE: The Blackett Laboratory, Imperial College of Science Technology and Medicine, London, SW7 2BW, UK
SOURCE: Chemical Physics Letters (2002), 366(1,2), 115-121
CODEN: CHPLBC; ISSN: 0009-2614
PUBLISHER: Elsevier Science B.V.
DOCUMENT TYPE: Journal
LANGUAGE: English

AB Macromols. in contact with both metallic colloids and oxygen may display unusually large dynamic hot-spots for surface enhanced Raman spectroscopy (SERS). The effect has been shown to exist in systems as

different as proteins (Hb) and carbon chain segments, but we also show here its existence in SERS of single-stranded DNA. The physicochem. origin of this effect is inquired into, and a specific model based on resonant charge-transfer interactions (mediated by oxygen) between the surface plasmons and the mols. is proposed as a microscopic origin. It is argued that, by a proper choice of lasers, the effect could be used for biomols. to detect traces down to a single-mol. level.
REFERENCE COUNT: 20 THERE ARE 20 CITED REFERENCES AVAILABLE FOR THIS
RECORD. ALL CITATIONS AVAILABLE IN THE RE FORMAT

L5 ANSWER 12 OF 60 CAPLUS COPYRIGHT 2004 ACS on STN
ACCESSION NUMBER: 2002:760683 CAPLUS
DOCUMENT NUMBER: 138:1419
TITLE: Investigation of ordered ds-DNA monolayers on gold electrodes
AUTHOR(S): Zhang, Rong-Ying; Pang, Dai-Wen; Zhang, Zhi-Ling; Yan, Jia-Wei; Yao, Jian-Lin; Tian, Zhong-Qun; Mao, Bing-Wei; Sun, Shi-Gang
CORPORATE SOURCE: Department of Chemistry, Wuhan University, Wuhan, 430072, Peop. Rep. China
SOURCE: Journal of Physical Chemistry B (2002), 106(43), 11233-11239
CODEN: JPCBFK; ISSN: 1520-6106
PUBLISHER: American Chemical Society
DOCUMENT TYPE: Journal
LANGUAGE: English
AB Double-stranded DNA(poly(dA)30·poly(dT)30) -modified gold electrodes, prepared by air-drying/adsorption method, have been investigated by various techniques, including cyclic voltammetry (CV), quartz crystal microbalance (QCM), electrochem. scanning tunneling microscopy (EC-STM), and surface-enhanced Raman scattering spectroscopy (SERS). CV and QCM results show that an average surface coverage of (7.50.2) 10 mol cm was obtained for poly(dA)poly(dT)-modified gold electrodes, close to the value for a saturated monolayer of ds-DNA lying flat on surfaces. EC-STM was used to evidence directly that ds-DNA forms a highly ordered and compact monolayer film on the gold substrate, whereas single-stranded DNA(poly(dT)) adopts a coiled configuration and, therefore, cannot form an ordered structure on the gold substrate. Moreover, it was demonstrated, for the first time, by SERS expts. that partial denaturation of duplexes occurs arising from the different interfacial orientations of A and T bases on the gold electrode surface. The adsorptive nature of the surface-bound ds-DNA was also elucidated, which results in the obtained DNA-modified gold surfaces stable in a wide range of potentials.
REFERENCE COUNT: 31 THERE ARE 31 CITED REFERENCES AVAILABLE FOR THIS

RECORD. ALL CITATIONS AVAILABLE IN THE RE FORMAT

L5 ANSWER 13 OF 60 CAPLUS COPYRIGHT 2004 ACS on STN
ACCESSION NUMBER: 2002:661467 CAPLUS
DOCUMENT NUMBER: 137:321679
TITLE: Thermal Desorption Behavior and Binding Properties of DNA Bases and Nucleosides on Gold
AUTHOR(S): Demers, Linette M.; Oestblom, Mattias; Zhang, Hua; Jang, Nak-Han; Liedberg, Bo; Mirkin, Chad A.
CORPORATE SOURCE: Department of Chemistry, Institute for Nanotechnology, Northwestern University, Evanston, IL, 60208, USA
SOURCE: Journal of the American Chemical Society (2002), 124(38), 11248-11249
CODEN: JACSAT; ISSN: 0002-7863
PUBLISHER: American Chemical Society
DOCUMENT TYPE: Journal
LANGUAGE: English
AB DNA monolayers on gold thin films and electrodes, as well as DNA-protected gold nanoparticles, are the basis for an increasing number of diagnostic applications that involve the use of surface-enhanced Raman spectroscopy (SERS), surface plasmon resonance spectroscopy (SPRS), and electrochem., scanometric, and colorimetric DNA detection strategies. Thus, the nature and strength of interactions of DNA with gold surfaces for both planar films and charged particles are subjects of great interest to researchers in the disciplines of biotechnol. and nanotechnol. Indeed, a number of studies aimed at elucidating the binding modes and conformation of DNA and its components (bases and nucleosides) on gold surfaces suggest that the DNA-gold interaction is complex and highly sequence-dependent. Herein, we use temperature-programmed desorption (TPD) and reflection absorption FT IR (RAIR) spectroscopy to directly examine the energetics of the DNA base-gold and DNA nucleoside-gold interactions. To the best of our knowledge this is the first study to quantify and compare the energetics of these important interactions between the fundamental chemical components of DNA and gold.
REFERENCE COUNT: 20 THERE ARE 20 CITED REFERENCES AVAILABLE FOR THIS
RECORD. ALL CITATIONS AVAILABLE IN THE RE FORMAT

L5 ANSWER 14 OF 60 CAPLUS COPYRIGHT 2004 ACS on STN
ACCESSION NUMBER: 2002:344007 CAPLUS
DOCUMENT NUMBER: 137:89891
TITLE: Adsorption of Polyethyleneimine on Silver Nanoparticles and Its Interaction with a Plasmid DNA: A Surface-Enhanced Raman Scattering Study

AUTHOR(S): Sanchez-Cortes, S.; Berenguel, R. Marsal; Madejon, A.; Perez-Mendez, M.
CORPORATE SOURCE: Instituto de Estructura de la Materia, CSIC, Madrid, 28006, Spain
SOURCE: Biomacromolecules (2002), 3(4), 655-660
CODEN: BOMAF6; ISSN: 1525-7797
PUBLISHER: American Chemical Society
DOCUMENT TYPE: Journal
LANGUAGE: English
AB Raman spectroscopy is applied in this work to study the adsorption of poly(ethyleneimine) (PEI) on Ag nanoparticles obtained by reduction with citrate, as well as to the study of the interaction between PEI and a plasmid. The surface-enhanced Raman spectroscopy (SERS) affords important information about the interaction and orientation of the polymer on the particles. In particular we have found that this polymer interacts with the surface through their amino groups in an interaction which also involves a change in the protonation state of amino groups as well as an increase of the chain order. This interaction implies a charge-transfer effect as deduced from the strong resonant effect in Raman spectra obtained at different excitation wavelengths. The complex formed by PEI and a plasmid, obtained by encoding the HBV (hepatitis B virus) genome inside the EcoRI restriction site of pGEM vector, was also studied by SERS. The interaction between both polymers leads to a conformational change affecting both macromols. that can be detected by Raman at different excitation wavelengths. PEI undergoes a change to a more disordered structure as well as an increase of the number of protonated amino groups. The plasmid undergoes a structural change from A-DNA structure to B-DNA, along with a change in the superhelicity resulting in a more lineal structure when the plasmid interacts with PEI.
REFERENCE COUNT: 41 THERE ARE 41 CITED REFERENCES AVAILABLE FOR THIS
RECORD. ALL CITATIONS AVAILABLE IN THE RE FORMAT

L5 ANSWER 15 OF 60 CAPLUS COPYRIGHT 2004 ACS on STN
ACCESSION NUMBER: 2002:287186 CAPLUS
DOCUMENT NUMBER: 137:12467
TITLE: Picosecond Coherent Vibrational Spectroscopy (CARS) of a DNA-Intercalating Ru Complex
AUTHOR(S): Ujj, Laszlo; Coates, Colin G.; Kelly, John M.; Kruger, Paul E.; McGarvey, John J.; Atkinson, George H.
CORPORATE SOURCE: Department of Chemistry and Optical Science Center, University of Arizona, Tucson, AZ, 85721, USA
SOURCE: Journal of Physical Chemistry B (2002), 106(18), 4854-4862
CODEN: JPCBFK; ISSN: 1089-5647
PUBLISHER: American Chemical Society

DOCUMENT TYPE: Journal
LANGUAGE: English
AB Vibrational spectra (1100-1800 cm-1) of the ground state and 2 excited electronic states, populated following the 5 ps, 440 nm excitation, of the [Ru(phen)2dppz]+2 (phen = 1,10-phenanthroline and dppz = dipyrido[3,2-a:2',3'-c] phenazine) complex in aqueous solution are measured by coherent anti-Stokes Raman scattering (CARS). The band origin positions of vibrational features in the picosecond resonance CARS (PR/CARS) spectrum of ground state [Ru(phen)2dppz]+2 obtained with <SYM119>1 (probe) wavelengths of 491 and 530 nm are the same to within <1 cm-1 and correlate well with 488 nm resonance Raman data. The relative intensities of features in the 491 and 530 nm CARS spectra, however, are significantly different, reflecting the differences in Raman resonance enhancement associated with changes in excitation wavelengths. High signal-to-noise vibrational CARS spectra of samples containing [Ru(phen)2dppz]+2 and calf thymus DNA are also recorded using 491 and 530 nm <SYM119>1 excitation. Relative to CARS data from [Ru(phen)2dppz]2+ alone, small, but well-defined, shifts in band origin positions and large relative intensity changes are present. These changes are discussed in relation to possible structural changes in [Ru(phen)2dppz]2+ attributable to its interactions with DNA. Picosecond transient absorption (PTA) signals, recorded over the initial 4.0 ns interval after 440 nm, 5 ps excitation and using 5 probe wavelengths in the 500-560 nm range, confirm the presence of 2 photophys. intermediates that were previously assigned as metal-ligand charge transfer (MLCT) excited states (i.e., MLCT(1) and MLCT(2)). Picosecond time-resolved CARS (PTR/CARS) spectra (<SYM119>1 = 530 nm) of [Ru(phen)2dppz]2+ in H2O, recorded at 23, 30, 100, 200, and 700 ps delays, provide 5 independent measurements of the MLCT(2) vibrational spectrum. Although the vibrational CARS features (positions and relative intensities) assigned to MLCT(2) remain the same throughout its 260 ps lifetime, the changes in their absolute intensities correlate closely with the PTA signals, thereby indicating that MLCT(2) has a well-defined and stable structure throughout and that little, if any, vibrational redistribution occurs during its 260 ps lifetime. The vibrational spectrum of another intermediate, not assignable to either ground state [Ru(phen)2dppz]2+ or its MLCT(2) state, is found in the 15 ps PTR/CARS data. Candidates for the assignment of this 2nd intermediate, including MLCT(1), are discussed.
REFERENCE COUNT: 36 THERE ARE 36 CITED REFERENCES AVAILABLE FOR THIS
RECORD. ALL CITATIONS AVAILABLE IN THE RE FORMAT

L5 ANSWER 16 OF 60 CAPLUS COPYRIGHT 2004 ACS on STN
ACCESSION NUMBER: 2002:78533 CAPLUS
DOCUMENT NUMBER: 136:113371
TITLE: Simple Multiplex Genotyping by Surface-

Enhanced Resonance Raman Scattering
AUTHOR(S): Graham, Duncan; Mallinder, Benjamin J.; Whitcombe, David; Watson, Nigel D.; Smith, W. Ewen
CORPORATE SOURCE: Department of Pure and Applied Chemistry, University of Strathclyde, Glasgow, G1 1XL, UK
SOURCE: Analytical Chemistry (2002), 74(5), 1069-1074
CODEN: ANCHAM; ISSN: 0003-2700
PUBLISHER: American Chemical Society
DOCUMENT TYPE: Journal
LANGUAGE: English
AB The accurate detection of DNA sequences is essential for a variety of post human genome projects including detection of specific gene variants for medical diagnostics and pharmacogenomics. A specific DNA sequence detection assay based on surface-enhanced resonance Raman scattering (SERRS) and an amplification refractory mutation system (ARMS) is reported. Initially, generation of PCR products was achieved by using specifically designed allele-specific SERRS active primers. Detection by SERRS of the PCR products confirmed the presence of the sequence tested for by the allele-specific oligonucleotides. This lead directly to the multiplex genotyping of human DNA samples for the <SYM68>F508 mutational status of the cystic fibrosis transmembrane conductance regulator gene using SERRS active primers in an ARMS assay. Removal of the unincorporated primers allowed fast and accurate anal. of the three genotypes possible in this system in a multiplex format without any separation of amplicons. The results indicate that SERRS can be used in modern genetic anal. and offers an opportunity for the development of novel assays. This is the first demonstration of the use of SERRS in multiplex genotyping and shows potential advantages over fluorescence as a detection technique with considerable promise for future development.
REFERENCE COUNT: 27 THERE ARE 27 CITED REFERENCES AVAILABLE FOR THIS
RECORD. ALL CITATIONS AVAILABLE IN THE RE FORMAT

L5 ANSWER 17 OF 60 CAPLUS COPYRIGHT 2004 ACS on STN
ACCESSION NUMBER: 2002:46832 CAPLUS
DOCUMENT NUMBER: 137:181848
TITLE: Synthesis of DNA and PNA oligomers specifically modified for surface enhanced resonance Raman scattering, SERRS
AUTHOR(S): Graham, Duncan; Brown, Rachel; Mallinder, Benjamin J.; Smith, W. Ewen
CORPORATE SOURCE: Department of Pure and Applied Chemistry, University of Strathclyde, Glasgow, G1 1XL, UK
SOURCE: Innovation and Perspectives in Solid Phase Synthesis & Combinatorial Libraries: Peptides, Proteins and

Nucleic Acids--Small Molecule Organic Chemistry Diversity, Collected Papers, International Symposium, 6th, York, United Kingdom, Aug. 31-Sept. 4, 1999 (2001 ), Meeting Date 1999, 127-130. Editor(s): Epton, Roger. Mayflower Scientific Ltd.: Kingswinford, UK.
CODEN: 69CEGV; ISBN: 0-9515735-3-5
DOCUMENT TYPE: Conference
LANGUAGE: English
AB Surface enhanced resonance Raman scattering (SERRS) has a similar sensitivity to fluorescence spectroscopy in detecting a specific DNA sequences and fragments, but it also has a unique advantage over fluorescence in that the scattering consists of sharp molecularly specific vibrational bands. In the experiment conducted, aggregated silver colloid was used as the surface since it gives good sensitivity and has been used previously with DNA. The two oligonucleotide probes used gave efficient Raman scattering from the surface and distinctly different signal patterns. The spectrum from the mixed sample indicated that the two oligonucleotides can be easily discriminated in a mixture Results showed that SERRS can be used to detect ultra-low levels of labeled DNA and can discriminate between mixts. of DNA without separation Multiple labeled PNA oligomers displayed a significant increase in signal as more labels are added. These findings indicated that SERRS can be utilized in meaningful biol. anal. and novel assays based on the results reported are under development.
REFERENCE COUNT: 4 THERE ARE 4 CITED REFERENCES AVAILABLE FOR THIS
RECORD. ALL CITATIONS AVAILABLE IN THE RE FORMAT

L5 ANSWER 18 OF 60 CAPLUS COPYRIGHT 2004 ACS on STN
ACCESSION NUMBER: 2001:685100 CAPLUS
DOCUMENT NUMBER: 136:352155
TITLE: Detection of DNA and P-450s on silver colloidal nanoparticles by surface-enhanced resonance Raman scattering (SERRS)
AUTHOR(S): Smith, W. Ewen; Polwart, Ewan; McLaughlin, Clare; Mallinder, Benjamin J.; Smith, Susan J.; Graham, Duncan
CORPORATE SOURCE: Department of Pure and Applied Chemistry, University of Strathclyde, Glasgow, UK
SOURCE: Proceedings of SPIE-The International Society for Optical Engineering (2001), 4258(Nanoparticles and Nanostructured Surfaces: Novel Reporters with Biological Applications), 73-79
CODEN: PSISDG; ISSN: 0277-786X
PUBLISHER: SPIE-The International Society for Optical Engineering
DOCUMENT TYPE: Journal

LANGUAGE: English
AB Surface-enhanced resonance Raman scattering (SERRS) is a very sensitive and selective detection method that can be used for the anal. of both DNA and P-450s. A number of factors have limited the broader application of the technique. These limitations are described and addressed. An approach to reduce the problems associated with variation of the silver colloids used to provide surface enhancement and chemical methodologies that ensure surface adsorption are presented. A practical approach was used to investigate the nature of the effect. This approach has highlighted the importance of resonance enhancement for ultimate sensitivity. Two approaches to achieve successful detection of DNA using SERRS are described, and, using these two approaches, the possibility of multiplexing is also demonstrated. The anal. of proteins by SERRS is discussed and P 450 is presented as a specific example of the information that may be gained from SERRS of proteins.
REFERENCE COUNT: 7 THERE ARE 7 CITED REFERENCES AVAILABLE FOR THIS
RECORD. ALL CITATIONS AVAILABLE IN THE RE FORMAT

L5 ANSWER 19 OF 60 CAPLUS COPYRIGHT 2004 ACS on STN
ACCESSION NUMBER: 2001:637282 CAPLUS
TITLE: Multiplex genotyping by SERRS using chemically modified oligonucleotides
AUTHOR(S): Graham, Duncan; Mallinder, Benjamin J.; Brown, Rachel; Smith, W. Ewen
CORPORATE SOURCE: Department of Pure and Applied Chemistry, University of Strathclyde, Glasgow, G1 1XL, UK
SOURCE: Abstracts of Papers, 222nd ACS National Meeting, Chicago, IL, United States, August 26-30, 2001 (2001), CARB-017. American Chemical Society: Washington, D. C.
CODEN: 69BUZP
DOCUMENT TYPE: Conference; Meeting Abstract
LANGUAGE: English
AB The accurate detection of DNA sequences is essential for a variety of post human genome projects including detection of specific gene variants for medical diagnostics and pharmacogenomics. A DNA sequence detection system based on surface enhanced resonance Raman scattering (SERRS) using specifically designed primer sequences, that had been chemical modified to make them SERRS active in an ARMS assay, is reported. This lead directly to the multiplex genotyping of human DNA samples for the DF508 mutational status of the cystic fibrosis transmembrane conductance regulator gene using SERRS. Removal of the unincorporated primers allowed fast and accurate anal. of the three genotypes possible in a multiplex format without any separation of amplicons. This is the first demonstration of the use of SERRS in multiplex

genotyping and shows potential advantages over fluorescence as a nucleic acid detection technique with considerable promise for future development by applying chemical manipulation to a phys. technique.

L5 ANSWER 20 OF 60 CAPLUS COPYRIGHT 2004 ACS on STN
ACCESSION NUMBER: 2001:372658 CAPLUS
DOCUMENT NUMBER: 135:207039
TITLE: Interactions of copper(II) porphyrins with DNA
AUTHOR(S): Pasternack, R. F.; Ewen, S.; Rao, A.; Meyer, A. S.; Freedman, M. A.; Collings, P. J.; Frey, S. L.; Ranen, M. C.; de Paula, J. C.
CORPORATE SOURCE: Department of Chemistry, Swarthmore College, Swarthmore, PA, 19081, USA
SOURCE: Inorganica Chimica Acta (2001), 317(1,2), 59-71
CODEN: ICHAA3; ISSN: 0020-1693
PUBLISHER: Elsevier Science S.A.
DOCUMENT TYPE: Journal
LANGUAGE: English
AB The interactions of three cationic water soluble copper(II) porphyrins, differing in peripheral substituents, with calf thymus DNA are described. Tetrakis(N-methylpyridinium-4-yl)porphinecopper(II) behaves as a simple intercalator under the conditions investigated, whereas tetrakis(4-N,N',N''-trimethylanilinium)porphinecopper(II), binds externally, with some limited aggregation under high drug load conditions. In contrast, trans-bis(N-methylpyridinium-4-yl)diphenylporphinecopper(II) (t-CuPagg), like the free-base t-H2Pagg from which it is derived, is capable of forming extended electronically coupled arrays while bound to the DNA template. These arrays have been investigated using a combination of extinction spectroscopy, CD, RLS and resonance Raman spectroscopy. They are found to contain 105-106 porphyrin units, arranged in long, narrow organized structures. The kinetics of assembly of t-CuPagg is reported on three DNAs: calf thymus (ct) DNA, poly(dG-dC)2 and poly(dA-dT)2. A non-conventional autocatalytic model first proposed for t-H2Pagg assembly formation is successful at fitting these data, permitting direct comparisons of kinetic parameters for the two porphyrins. It is found that the catalytic rate constant (kc) is considerably smaller for t-CuPagg than for t-H2Pagg under comparable conditions, and that the template rigidity fosters assembly formation. We also report the resonance Raman spectra of t-H2Pagg/ct DNA and t-CuPagg/ct DNA complexes. Aggregation on the DNA template changes the intensity pattern of the porphyrin's resonance Raman spectra, with some low- and high-frequency bands becoming strongly enhanced upon aggregation. We conclude that aggregation-enhanced resonance Raman spectroscopy is a useful probe of aggregation in porphyrin-DNA complexes that also gives detailed

information about structural changes that accompany the aggregation process.
REFERENCE COUNT: 56 THERE ARE 56 CITED REFERENCES AVAILABLE FOR THIS
RECORD. ALL CITATIONS AVAILABLE IN THE RE FORMAT

L5 ANSWER 21 OF 60 CAPLUS COPYRIGHT 2004 ACS on STN
ACCESSION NUMBER: 2001:370259 CAPLUS
DOCUMENT NUMBER: 135:277851
TITLE: The study of the doxorubicin adsorbed onto chemically modified silver films by surface-enhanced spectroscopy
AUTHOR(S): Strekal, N.; German, A.; Gachko, G.; Maskevich, A.; Maskevich, S.
CORPORATE SOURCE: Department of Physics, Yanka Kupala State University of Grodno, Grodno, 230023, Belarus
SOURCE: Journal of Molecular Structure (2001), 563-564, 183-191
CODEN: JMOSB4; ISSN: 0022-2860
PUBLISHER: Elsevier Science B.V.
DOCUMENT TYPE: Journal
LANGUAGE: English
AB This work presents some aspects of surface-enhanced spectroscopy application to the study of intermol. interactions of antitumor drugs with microenvironment in compound mol. systems. The surface-enhanced fluorescence (SEF) spectra and the surface-enhanced resonance Raman scattering (SERRS) spectra of doxorubicin (DOX) adsorbed on silver films (SF), annealed silver films (ASF) and chemical modified ASF are exposed and compared with corresponding spectra of DOX in water solution and on silver sols. The existence of complicated dependencies for both (SERRS and SEF) components of surface-enhanced secondary emission of DOX on ASF on optical and chemical properties of used films are discussed. Changes detectable in SERRS spectra of DOX at transition from solns. to sols, from sols to SF and further to ASF and chemical modified ASF are also discussed and considered as a result of a change in number and/or activity of specific adsorption sites on silver surface. These spectral changes are very similar to those in resonance Raman (RR) spectra of intercalated complex of DOX with DNA and in RR spectra of aclacinomicin. The breakage of intramol. hydrogen bonds and effects of changing of chromophore moiety local symmetry of DOX are considered.
REFERENCE COUNT: 10 THERE ARE 10 CITED REFERENCES AVAILABLE FOR THIS
RECORD. ALL CITATIONS AVAILABLE IN THE RE FORMAT

L5 ANSWER 22 OF 60 CAPLUS COPYRIGHT 2004 ACS on STN

ACCESSION NUMBER: 2000:739278 CAPLUS
DOCUMENT NUMBER: 134:233810
TITLE: Characterization of DNA isolated from normal and cancerous ovarian tissues by ultraviolet resonance Raman spectroscopy
AUTHOR(S): Zhao, Xiaojie; Vinson, Michael A.; Malins, Donald C.; Spiro, Thomas G.
CORPORATE SOURCE: Department of Chemistry, Princeton University, Princeton, NJ, 08544, USA
SOURCE: Proceedings of SPIE-The International Society for Optical Engineering (2000), 3918(Biomedical Spectroscopy: Vibrational Spectroscopy and Other Novel Techniques), 146-152
CODEN: PSISDG; ISSN: 0277-786X
PUBLISHER: SPIE-The International Society for Optical Engineering
DOCUMENT TYPE: Journal
LANGUAGE: English
AB We report significant differences in UV resonance Raman (UVRR) spectra of DNA samples from normal and cancerous tissues. The four bases of DNA, adenosine, thymine, guanosine and cytidine, can be enhanced in UVRR spectra, and their intensities are very sensitive to base stacking and DNA H-bonding. 14 DNA samples from patients at different stages of ovarian cancer, 5 from normal, 2 from primary, 3 from metastasis primary and 4 from distant metastasis tumor tissues, were characterized by 257, 238, 229, 220 and 210 nm-excited UVRR spectra. Raman spectral difference between normal and tumor DNA could be readily detected.
REFERENCE COUNT: 17 THERE ARE 17 CITED REFERENCES AVAILABLE FOR THIS RECORD. ALL CITATIONS AVAILABLE IN THE RE FORMAT

L5 ANSWER 23 OF 60 CAPLUS COPYRIGHT 2004 ACS on STN
ACCESSION NUMBER: 2000:292992 CAPLUS
DOCUMENT NUMBER: 133:346660
TITLE: Selective detection of deoxyribonucleic acid at ultra low concentrations by SERRS
AUTHOR(S): Graham, Duncan; Smith, W. Ewen; Mallinder, Benjamin J.; Linacre, Adrian M. T.; Watson, Nigel D.; White, Peter C.
CORPORATE SOURCE: Department of Pure and Applied Chemistry, University of Strathclyde, Glasgow, G1 1XL, UK
SOURCE: Spectroscopy of Biological Molecules: New Directions, European Conference on the Spectroscopy of Biological Molecules, 8th, Enschede, Netherlands, Aug. 29-Sept. 2, 1999 (1999), 541-544. Editor(s): Greve, Jan; Puppels, Gerwin J.; Otto, Cees. Kluwer Academic

Publishers: Dordrecht, Neth.
CODEN: 68WFAJ
DOCUMENT TYPE: Conference
LANGUAGE: English
AB The development of methods of detection of DNA using surface enhanced resonance Raman scattering (SERRS) could have unique advantages particularly in mol. biol. and medical programs. A quant. SERRS method has been developed based upon adsorption of DNA on colloidal silver and subsequent signal detection of a suitable chromophore. The main problems encountered were that the bases have a chromophore in the UV region so that a label is required for visible or near IR SERRS and that the highly neg. charged DNA would not adsorb onto the neg. charged citrate-reduced silver colloid used as substrate. The problem of detecting a suitable chromophore was overcome by the covalent addition of a label, 2,5,1',3',7',9'-hexachloro-6-carboxyfluorescein (HEX), to the end of the DNA strand in question. The problem of adherence of the DNA to the surface was overcome by two modifications to standard SERRS procedures. Firstly, an organic polyamine, spermine was added to the DNA in excess prior to addition to the colloidal suspension. Secondly, although SERRS can be obtained with the first modification alone, a more robust technique was developed by the use of propargyl amino modified DNA bases.
REFERENCE COUNT: 3 THERE ARE 3 CITED REFERENCES AVAILABLE FOR THIS
RECORD. ALL CITATIONS AVAILABLE IN THE RE FORMAT

L5 ANSWER 24 OF 60 CAPLUS COPYRIGHT 2004 ACS on STN
ACCESSION NUMBER: 2000:244797 CAPLUS
DOCUMENT NUMBER: 133:101573
TITLE: Surface-enhanced resonance Raman scattering as a novel method of DNA discrimination
AUTHOR(S): Graham, Duncan; Mallinder, Benjamin J.; Smith, W. Ewan
CORPORATE SOURCE: Dep. Pure Appl. Chem., Univ. Strathclyde, Glasgow, G1 1XL, UK
SOURCE: Angewandte Chemie, International Edition (2000), 39(6), 1061-1063
CODEN: ACIEF5; ISSN: 1433-7851
PUBLISHER: Wiley-VCH Verlag GmbH
DOCUMENT TYPE: Journal
LANGUAGE: English
AB Surface-enhanced resonance Raman scattering was used to discriminated between different oligodeoxyribonucleotides in mixts. without requiring separation The probes 2,5,2',4',5',7'-hexachloro-6-carboxyfluorescein[sic] and rhodamine 6G were used to label the DNA mols.
REFERENCE COUNT: 11 THERE ARE 11 CITED REFERENCES AVAILABLE FOR THIS

RECORD. ALL CITATIONS AVAILABLE IN THE RE FORMAT

L5 ANSWER 25 OF 60 CAPLUS COPYRIGHT 2004 ACS on STN
ACCESSION NUMBER: 2000:242226 CAPLUS
DOCUMENT NUMBER: 133:13201
TITLE: Detection and identification of labeled DNA by surface enhanced resonance Raman scattering
AUTHOR(S): Graham, D.; Mallinder, B. J.; Smith, W. E.
CORPORATE SOURCE: Department of Pure and Applied Chemistry, University of Strathclyde, Glasgow, G1 1XL, UK
SOURCE: Biopolymers (2000), 57(2), 85-91
CODEN: BIPMAA; ISSN: 0006-3525
PUBLISHER: John Wiley & Sons, Inc.
DOCUMENT TYPE: Journal
LANGUAGE: English
AB The detection of specific sequences of DNA bases in a single strand can be achieved by hybridization of a known sequence of synthetic DNA. Due to the low concns. usually used, a fluorescent label is required to detect the probe. Surface enhanced resonance Raman scattering (SERRS) also has the required sensitivity and provides a specific set of signals that are more applicable to discrimination of a number of probes without separation A reliable SERRS method is reported here using two probes specifically designed for SERRS. It was possible to detect a 2+10-12M solution of labeled DNA, which illustrated the sensitive nature of SERRS for DNA anal.
REFERENCE COUNT: 16. THERE ARE 16 CITED REFERENCES AVAILABLE FOR THIS RECORD. ALL CITATIONS AVAILABLE IN THE RE FORMAT

L5 ANSWER 26 OF 60 CAPLUS COPYRIGHT 2004 ACS on STN
ACCESSION NUMBER: 1999:753375 CAPLUS
DOCUMENT NUMBER: 132:9592
TITLE: Identification of minute amounts of labeled nucleic acid sequence using SERRS Raman spectroscopy on a colloidal surface
INVENTOR(S): Whitcombe, David Mark; Graham, Duncan; Smith, William Ewen
PATENT ASSIGNEE(S): Zeneca Limited, UK
SOURCE: PCT Int. Appl., 61 pp.
CODEN: PIXXD2
DOCUMENT TYPE: Patent
LANGUAGE: English
FAMILY ACC. NUM. COUNT: 1
PATENT INFORMATION:

PATENT NO. KIND DATE APPLICATION NO. DATE

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WO 9960157 A1 19991125 WO 1999-GB1597 19990520
W: AE, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, CA, CH, CN, CU, CZ, DE, DK, EE, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MD, MG, MK, MN, MW, MX, NO, NZ, PL, PT, RO, RU, SD, SE, SG, SI, SK, SL, TJ, TM, TR, TT, UA, UG, US, UZ, VN, YU, ZA, ZW, AM, AZ, BY, KG, KZ, MD, RU, TJ, TM
RW: GH, GM, KE, LS, MW, SD, SL, SZ, UG, ZW, AT, BE, CH, CY, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE, BF, BJ, CF, CG, CI, CM, GA, GN, GW, ML, MR, NE, SN, TD, TG
AU 9939465 A1 19991206 AU 1999-39465 19990520
EP 1080223 A1 20010307 EP 1999-922368 19990520
EP 1080223 B1 20030903
R: AT, BE, CH, DE, DK, ES, FR, GB, GR, IT, LI, LU, NL, SE, MC, PT, IE, FI
JP 2002515590 T2 20020528 JP 2000-549763 19990520
AT 248929 E 20030915 AT 1999-922368 19990520
PRIORITY APPLN. INFO.: GB 1998-10865 A 19980520
WO 1999-GB1597 W 19990520

AB Disclosed are methods for determining the presence or absence of a target nucleic acid (e.g. DNA) sequence in a sample nucleic acid, comprising: (a) exposing the sample to a detection agent comprising a colloid metal surface associated with a surface enhanced resonance Raman scattering (SERRS) active species (SAS) such as an azo dye and with a target binding species (TBS) which may be PNA which is complementary to the target, and (b) observing the sample/agent mixture using SERRS to detect any surface enhancement of the label, characterized in that the binding of the TBS to the target sequence causes surface enhancement of the SAS. The detection agent may be exposed to the sample in step (a) as two or more sep. components and will generally comprise a first agent and a second agent each having a different TBS, each TBS being capable of binding to the target sequence, and wherein the binding of the first and second TBS to the target sequence brings a metal surface associated with each TBS into proximity thereby causing surface enhancement of an SAS associated with one or both of the metal surfaces. Generally a surface seeking group such as the benzotriazole group is used to promote chemisorption of the SAS and/or TBS to the metal surface. The method may be multiplexed, and has a variety of applications, particularly in the field of mol. biol. Also provided are processes for producing detection agents, the agents themselves, and associated compns., systems, apparatus, kits and use of the same.

REFERENCE COUNT: 9 THERE ARE 9 CITED REFERENCES AVAILABLE FOR THIS RECORD. ALL CITATIONS AVAILABLE IN THE RE FORMAT

L5 ANSWER 27 OF 60 CAPLUS COPYRIGHT 2004 ACS on STN
ACCESSION NUMBER: 1999:473093 CAPLUS
DOCUMENT NUMBER: 131:283463
TITLE: Three-dimensional spectra of the long-range assembly of Nile Blue sulfate on the molecular surface of DNA and determination of DNA by light-scattering
AUTHOR(S): Huang, Cheng Zhi; Li, Yuan Fang; Hu, Xiao Li; Li, Nian Bin
CORPORATE SOURCE: Institute of Environmental Chemistry, Southwest Normal University, Chungking, 400715, Peop. Rep. China
SOURCE: Analytica Chimica Acta (1999), 395(1-2), 187-197
CODEN: ACACAM; ISSN: 0003-2670
PUBLISHER: Elsevier Science B.V.
DOCUMENT TYPE: Journal
LANGUAGE: English
AB The features of the three-dimensional (3-D) emission spectrum of the long range assembly of Nile Blue sulfate (NBS) on the mol. surfaces of DNAs were discussed. It was found that the emission signals involve resonance light-scattering (RLS, <SYM108>RLS = <SYM108>ex), second order light-scattering (SLS, <SYM108>SLS = 2<SYM108>ex), anti-second order light-scattering (ASLS, <SYM108>ASLS = 0.5 <SYM108>ex), Raman light-scattering (Raman, <SYM108>RLSR = -49.0 + 1.28<SYM108>ex, <SYM108>SLSR = -52.0 + 0.64 <SYM108>ex, and <SYM108>ASLSR = -171.7 + 2.86 <SYM108>ex), and fluorescence (<SYM108>ex = 545.0 nm, <SYM108>em = 610.0 nm). The wavelengths of all light-scattering signals keep linear relationships with at of the incident light beam (<SYM108>ex), and the intensities of the light-scattering signals in the 3-D spectrum are in the order: IRLS ISLS IASLS IRLSR ISLSR IASLSR. At pH 7.20-7.80 and ionic strength 0.012, these signals, including RLS, SLS, and ASLA, were found to be strongly enhanced because of the long range assembly of NBS on the mol. surface of both calf thymus DNA (ctDNA) and fish sperm DNA (fsDNA). Fluorescence quenching of NBS by DNAs occurs, but no significantly enhanced Raman light-scattering signals of NBS can be detected in the long range assembly. By independently using the enhanced intensity of RLS at 293.8 nm (<SYM108>ex = 293.8 nm), ASLS intensity at 293.8 nm (<SYM108>ex = 587.6 nm), or SLS intensity at 587.6 nm (<SYM108>ex = 293.8 nm), ctDNA and fsDNA at nanogram levels can be determined with identical results.
REFERENCE COUNT: 26 THERE ARE 26 CITED REFERENCES AVAILABLE FOR THIS
RECORD. ALL CITATIONS AVAILABLE IN THE RE FORMAT

L5 ANSWER 28 OF 60 CAPLUS COPYRIGHT 2004 ACS on STN
ACCESSION NUMBER: 1999:376340 CAPLUS
DOCUMENT NUMBER: 131:195900

TITLE: Metallation kinetics of a free base porphyrin in surface-enhanced resonance Raman scattering active Ag colloid system as a probe of porphyrin-nucleic acids interaction
AUTHOR(S): Prochazka, M.; Turpin, P.-Y.; Stepanek, J.; Bok, J.
CORPORATE SOURCE: Institute of Physics, Charles University, Prague, Czech Rep.
SOURCE: Journal of Molecular Structure (1999), 482-483, 221-224
CODEN: JMOSB4; ISSN: 0022-2860
PUBLISHER: Elsevier Science B.V.
DOCUMENT TYPE: Journal
LANGUAGE: English
AB Complexes of the cationic free base 5,10,15,20-tetrakis (1-methyl-4-pyridyl) porphyrin with DNA, double-stranded poly(dA-dT) and poly(dG-dC) polynucleotides have been studied by using surface-enhanced resonance Raman scattering spectroscopy (SERRS). SERRS spectra of these complexes have been recorded during time-scale varying from minutes to days, and the differences in the course of the porphyrin metalation, indicating different accessibility of the metal surface for the porphyrin core in the case of particular complexes, have been monitored. The results obtained for the three studied systems are in very good agreement with the expected dominant types of the porphyrin interaction with the nucleic acids, i.e., intercalation in the case of poly(dG-dC) and external binding in the case of poly(dA-dT).
REFERENCE COUNT: 9 THERE ARE 9 CITED REFERENCES AVAILABLE FOR THIS RECORD. ALL CITATIONS AVAILABLE IN THE RE FORMAT

L5 ANSWER 29 OF 60 CAPLUS COPYRIGHT 2004 ACS on STN
ACCESSION NUMBER: 1999:368621 CAPLUS
DOCUMENT NUMBER: 131:195663
TITLE: Identification by UV resonance Raman spectroscopy of an imino tautomer of 5-hydroxy-2'-deoxycytidine, a powerful base analog transition mutagen with a much higher unfavored tautomer frequency than that of the natural residue 2'-deoxycytidine
AUTHOR(S): Suen, Wu; Spiro, Thomas G.; Sowers, Lawrence C.; Fresco, Jacques R.
CORPORATE SOURCE: Department of Molecular Biology, Princeton University, Princeton, NJ, 08544, USA
SOURCE: Proceedings of the National Academy of Sciences of the United States of America (1999), 96(8), 4500-4505
CODEN: PNASA6; ISSN: 0027-8424

PUBLISHER: National Academy of Sciences
DOCUMENT TYPE: Journal
LANGUAGE: English
AB UV resonance Raman spectroscopy was used to detect and estimate the frequency of the unfavored imino tautomer of the transition mutagen 5-hydroxy-2'-deoxycytidine (HO5dCyt) in its anionic form. In DNA, this 2'-deoxycytidine analog arises from the oxidation of 2'-deoxycytidine and induces C <SYM174> T transitions with 102 greater frequency than such spontaneous transitions. An imino tautomer marker carbonyl band (<SYM187>1650 cm-1) is enhanced at <SYM187>65°C against an otherwise stable spectrum of bands associated with the favored amino tautomer. This band is similarly present in the UV resonance Raman spectra of the imino cytidine analogs N3-methylcytidine at high pH and N4-methoxy-2'-deoxycytidine at pH 7 and displays features attributable to the imino form of C residues and their derivs. The fact that the imino tautomer of HO5dCyt occurs at a frequency consistent with its high mutagenic enhancement lends strong support to the hypothesis that unfavored base tautomers play important roles in the mispair intermediates of replication leading to substitution mutations.
REFERENCE COUNT: 33

L5 ANSWER 30 OF 60 CAPLUS COPYRIGHT 2004 ACS on STN
ACCESSION NUMBER: 1998:637337 CAPLUS
DOCUMENT NUMBER: 130:47966
TITLE: Detection of a DNA sequence by surface enhanced resonance Raman scattering of a modified DNA probe
AUTHOR(S): Watson, N.; Graham, Duncan; Smith, W. Ewan; White, Peter; Linacre, Adrian
CORPORATE SOURCE: Forensic Science Unit, Department of Pure and Applied Chemistry, Royal College, University of Strathclyde, Glasgow, G1 1XW, UK
SOURCE: International Congress Series (1998), 1167(Progress in Forensic Genetics 7), 6-8
CODEN: EXMDA4; ISSN: 0531-5131
PUBLISHER: Elsevier Science B.V.
DOCUMENT TYPE: Journal
LANGUAGE: English
AB This work describes an alternative detection system for DNA amplification products exploiting Surface Enhanced Resonance Raman Scattering or SERRS. A DNA oligonucleotide specially modified for use with the SERRS technique can be used as a conventional DNA amplification, site specific, primer. However, sensitivity of the technique is such that the geometric increase in copy number of the target site may be substantially reduced or eliminated, in which case the special oligo may be regarded as a probe. The DN is modified so as to contain pos. charged amine groups which will interact strongly with a colloidal surface, and a HEX label which experiences surface enhancement from a silver colloidal substrate. REFERENCE COUNT: 1

L5 ANSWER 35 OF 60 CAPLUS COPYRIGHT 2004 ACS on STN
ACCESSION NUMBER: 1997:220661 CAPLUS
DOCUMENT NUMBER: 126:209294
TITLE: Detection of nucleic acids and nucleic acid units
INVENTOR(S): Graham, Duncan; Linacre, Adrian Matthew Thornton; Munro, Calum Hugh; Smith, William Ewan; Watson, Nigel Dean; White, Peter Cyril
PATENT ASSIGNEE(S): University of Strathclyde, UK
SOURCE: PCT Int. Appl., 196 pp.
CODEN: PIXXD2
DOCUMENT TYPE: Patent
LANGUAGE: English

| PATENT NO. | KIND | DATE | APPLICATION NO. | DATE |
|---|---|---|---|---|
| WO 9705280 | A1 | 19970213 | WO 1996-GB1830 | 19960725 |
| AU 9666238 | A1 | 19970226 | AU 1996-66238 | 19960725 |
| EP 871774 | A1 | 19981021 | EP 1996-925873 | 19960725 |
| JP 11510385 | T2 | 19990914 | JP 1996-507358 | 19960725 |
| US 6127120 | A | 20001003 | US 1998-983486 | 19980421 |

PRIORITY APPLN. INFO.: GB 1995-17955 A 19950725
WO 1996-GB1830 W 19960725

AB The invention relates to the detection of target nucleic acids or nucleic acid units in a sample, by obtaining a SER(R)S spectrum for a SER(R)S-active complex containing, or derived directly from, the target. The complex includes at least a SER(R)S-active label, and optionally a target binding species containing a nucleic acid or nucleic acid unit. In this detection method, the concentration of the target present in the SER(R)S-active complex, or of the nucleic acid or unit contained in the target binding species in the SER(R)S-active complex, is no higher than 10-10M. Addnl. or alternatively, <SYM179>1 of the following features may be used with the method: (1) the introduction of a polyamine; (2) modification of the target and/or of the nucleic acid or nucleic acid unit contained in the target binding species, in a manner that promotes or facilitates its chemisorption onto a SER(R)S-active surface; (3) inclusion of a chemisorptive functional group in the SER(R)S-active label. The invention also provides SER(R)S-active complexes for use in such a method, a kit for use in carrying out the method or preparing the complexes, and a method for sequencing a nucleic acid which comprises the use of the detection method to detect a least one target nucleotide or sequence of nucleotides within the acid.

L5 ANSWER 43 OF 60 CAPLUS COPYRIGHT 2004 ACS on STN
ACCESSION NUMBER: 1995:320009 CAPLUS
DOCUMENT NUMBER: 122:122370
TITLE: Does Adsorption on the Surface of a Silver Colloid Perturb Drug/DNA Interactions? Comparative SERS, FT-SERS, and Resonance Raman Study of Mitoxantrone and Its Derivatives
AUTHOR(S): Nabiev, Igor; Baranov, Alexandre; Chourpa, Igor; Beljebbar, Abdel; Sockalingum, Ganesh D.; Manfait, Michel

CORPORATE SOURCE: Laboratoire de Spectroscopie Biomoleculaire, Universite de Reims Champagne-Ardenne, Reims, 51096, Fr.
SOURCE: Journal of Physical Chemistry (1995), 99(5), 1608-13
CODEN: JPCHAX; ISSN: 0022-3654
PUBLISHER: American Chemical Society
DOCUMENT TYPE: Journal
LANGUAGE: English
AB SERS spectra of the potent antitumor agent mitoxantrone in aqueous hydrosol and in the hydrosol prepared from deuterium oxide and of its complexes with DNA have been recorded and compared with the corresponding preresonance Raman (pre-RR) and FT-SERS spectra of the same species. SERS and pre-RR spectra obtained at the same excitation wavelength and at concns. of 5+10-8 and 5+10-5 M, resp., were nearly identical both in the frequencies and the relative intensities of the bands. Moreover, interactions between the drug and calf thymus DNA induced identical effects in the pre-resonance Raman, surface-enhanced Raman scattering (SERS), and Fourier transform SERS spectra of the drugs. An anal. of these spectral changes showed that an interaction involves preferential intercalation of the ring A and, in part, ring B of the chromophore inside the DNA double-stranded helix. The structural specificity of the mitoxantrone intercalation has been studied by SERS anal. of the complexes between the drug and DNA duplexes [d(CpG)9]2 and [d(ApT)9]2. Mitoxantrone was intercalated preferentially within the CG-rich regions of the double-stranded helix. The data show that the adsorption of the drug/DNA complex on the surface of silver hydrosol does not induce detectable perturbations of the mol. interactions within the complex and thus demonstrate the applicability of SERS for the anal. of drug/DNA interactions under conditions preserving the structure of the complexes and at extremely low concns.

L5 ANSWER 49 OF 60 CAPLUS COPYRIGHT 2004 ACS on STN
ACCESSION NUMBER: 1992:75814 CAPLUS
DOCUMENT NUMBER: 116:75814
TITLE: Raman spectroscopic studies of complexes of m-amsacrine with calf-thymus DNA
AUTHOR(S): Butler, C. A.; Barton, T. F.; Cooney, R. P.; Denny, W. A.
CORPORATE SOURCE: Dep. Chem., Univ. Auckland, Auckland, N. Z.
SOURCE: Special Publication - Royal Society of Chemistry (1991), 94(Spectrosc. Biol. Mol.), 365-6
CODEN: SROCDO; ISSN: 0260-6291
DOCUMENT TYPE: Journal
LANGUAGE: English
AB Resonance Raman (RR) spectroscopy and surface enhanced Raman spectroscopy (SERS) were used to record spectra of the antitumor agent m-amsacrine (m-AMSA) in aqueous solution The effects of solution pH, drug concentration, exciting line and potential were investigated. The aim of this study was to detect spectroscopically the intercalation of m-AMSA into calf-thymus DNA, and then to apply this technique to determining the DNA binding mechanisms of other drug mols.

L5 ANSWER 50 OF 60 CAPLUS COPYRIGHT 2004 ACS on STN

ACCESSION NUMBER: 1991:574200 CAPLUS
DOCUMENT NUMBER: 115:174200
TITLE: Intercalation between antitumor anthracyclines and DNA as probed by resonance and surface-enhanced Raman spectroscopy
AUTHOR(S): Smulevich, G.; Mantini, A. R.; Casu, M.; Marzocchi, M. P.
CORPORATE SOURCE: Dip. Chim., Florence, Italy
SOURCE: Proceedings of SPIE-The International Society for Optical Engineering (1991), 1403(Laser Appl. Life Sci., Pt. 1), 125-7
CODEN: PSISDG; ISSN: 0277-786X
DOCUMENT TYPE: Journal
LANGUAGE: English
AB A model of anthracycline intercalation with DNA is developed using resonance and surface-enhanced Raman spectroscopy.

L5 ANSWER 54 OF 60 CAPLUS COPYRIGHT 2004 ACS on STN
ACCESSION NUMBER: 1989:205111 CAPLUS
DOCUMENT NUMBER: 110:205111
TITLE: "Ultraviolet resonance Raman spectroscopy of distamycin complexes with poly(dA)-poly(dT) and poly(dA-dT): role of hydrogen bonding"
AUTHOR(S): *Grygon, Christine A.; Spiro, Thomas G.*
CORPORATE SOURCE: Dep. Chem., Princeton Univ., Princeton, NJ, 08544-1009, USA
SOURCE: **Biochemistry (1989), 28(10), 4397-402**
CODEN: BICHAW; ISSN: 0006-2960
DOCUMENT TYPE: Journal
LANGUAGE: English
AB Excitation at 320 nm produces resonance-enhanced Raman spectra of distamycin showing strong band associated with the amide and (coupled) pyrrole ring modes. The amide frequencies shift upon binding to poly(dA-dT) and poly(dA)-poly(dT) in a manner indicating weaker interactions of water mols. with distamycin C=O groups, perhaps reflecting the ordering effects of the backbone phosphate groups. The available data suggest that the amide frequencies are insensitve to the degree of NH H-bonding and are therefore uninformative about the exetent of distamycin NH interactions with the DNA bases, although the absence of any intensity effects on the 200 nm-excited UVRR spectra suggests the absence of strong interactions. The DNA Raman bands sharpen noticeably upon distamycin binding, probably due to restricted conformational mobility of the bases.

L5 ANSWER 55 OF 60 CAPLUS COPYRIGHT 2004 ACS on STN
ACCESSION NUMBER: 1989:3246 CAPLUS
DOCUMENT NUMBER: 110:3246
TITLE: "Raman and surface enhanced Raman spectroscopy of helix destabilizing proteins and nucleotides"
AUTHOR(S): *Otto, C.*
CORPORATE SOURCE: Tech. Univ. Twente, Eschede, Neth.
SOURCE: **Report (1987), Order No. PB88-171517, 161 pp. Avail.: NTIS From: Gov. Rep. Announce. Index (U. S.) 1988, 88(11), Abstr. No. 828,242**

DOCUMENT TYPE: Report
LANGUAGE: English
AB Normal Raman spectroscopy (NRS), resonant Raman spectroscopy (NRS), and surface-enhanced Raman spectroscopy (SERS) were used to study the interaction of proteins and nucleotides. An interpretation was presented of the Raman spectra of the helix-destabilizing proteins gene product 32 (gp32) of bacteriophage T4 and gene product 5 (gp5) of bacteriophage M13 and complexes of these proteins with single-stranded (poly)nucleotides. Also, an interpretation was presented on the SERS spectra of the base mols. which occur in DNA. The bands in the spectra were assigned to normal coordinates. The orientation of the mol. plane of cytosine and thymine was probably tilted with respect to the surface. Apparently, carboxyl groups of these mols. were positioned closest to the surface. Adenine adsorbs to the surface with the external amino group. The hypothesis is supported by the results of the investigation of methylated derivs. of adenine.

L5 ANSWER 56 OF 60 CAPLUS COPYRIGHT 2004 ACS on STN
ACCESSION NUMBER: 1988:215909 CAPLUS
DOCUMENT NUMBER: 108:215909
TITLE: Resonance Raman and SERRS spectra of antitumor anthracyclines and their complexes with DNA
AUTHOR(S): Smulevich, Giulietta; Feis, Alessandro; Mantini, Anna Rita; Marzocchi, Mario P.
CORPORATE SOURCE: Dip. Chim., Univ. Florence, Florence, 50121, Italy
SOURCE: Indian Journal of Pure and Applied Physics (1988), 26(2-3), 207-11
CODEN: IJOPAU; ISSN: 0019-5596
DOCUMENT TYPE: Journal
LANGUAGE: English
AB The normal and surface-enhanced resonance Raman spectra (SERRS) of idarubicin, epirubicin, and their complexes with DNA were measured. The results were correlated with previous studies on adriamycin and 11-deoxycarminomycin. The same model of binding with the Ag colloid surface and the same structure of the intercalative complex with DNA was proposed for the 4 anthracyclines.

L5 ANSWER 57 OF 60 CAPLUS COPYRIGHT 2004 ACS on STN
ACCESSION NUMBER: 1986:583506 CAPLUS
DOCUMENT NUMBER: 105:183506
TITLE: "Surface-enhanced resonance Raman spectra of adriamycin, 11-deoxycarminomycin, their model chromophores, and their complexes with DNA"
AUTHOR(S): *Smulevich, Giulietta; Feis, Alessandro*
CORPORATE SOURCE: Dip. Chim., Univ. Firenze, Florence, 50121, Italy
SOURCE: **Journal of Physical Chemistry (1986), 90(23), 6388-92**
CODEN: JPCHAX; ISSN: 0022-3654
DOCUMENT TYPE: Journal
LANGUAGE: English
AB The surface-enhanced Raman spectra of Ag sols of adriamycin [23214-92-8], 11-deoxycarminomycin [81382-07-2], their model chromophores 1,4- [81-64-1] and 1,8-

dihydroxyanthraquinone [117-10-2], and their complexes with DNA were measured. The well-detailed spectra yieled by the combined anal. in terms of symmetry and pseudosymmetry, a nearly complete vibrational assignment of the resonance Raman active modes. The spectra perturbations induced by the adsorption of the compds. onto the Ag particles, by comparison with their resonance Raman spectra in solution, were explained in terms of interaction between one C:O.tplbond.O-H group of the chromophore and the Ag surface. The intensity of reduction of some bands associated with the HOCCC=O groups observed in the drug/DNA complexes was interpreted in terms of changes between the ground and the excited states of the normal coordinates and(or) their equilibrium positions. The inferred structures of the complexes was consistent with intercalation between daunorubicin and the DNA fragment d(CpGpTpApCpG) previously reported from X-ray measurements.

L5 ANSWER 59 OF 60 CAPLUS COPYRIGHT 2004 ACS on STN
ACCESSION NUMBER: 1984:468743 CAPLUS
DOCUMENT NUMBER: 101:68743
TITLE: "Contribution of the resonance Raman spectroscopy to the identification of Z DNA"
AUTHOR(S): *Jolles, Beatrice; Chinsky, Laurent; Laigle, Alain*
CORPORATE SOURCE: Lab. Curie, Inst. Curie, Paris, 75231/05, Fr.
SOURCE: **Journal of Biomolecular Structure & Dynamics (1984), 1(6), 1335-46**
CODEN: JBSDD6; ISSN: 0739-1102
DOCUMENT TYPE: Journal
LANGUAGE: English
AB Poly(dG-dC)·poly(dG-dC) at low salt concentration (0.1M NaCl) and at high salt concentration (4.5M NaCl) has been studied by Raman resonance spectroscopy, using 2 excitation wavelengths: 257 nm and 295 nm. As resonance enhances the intensity of the lines in proportion to the square of the molar absorption coefficient, the intensities of the lines with 295 nm wavelength excitation are enhanced .apprx.7-fold during the B-to-Z transition. With excitation at 257 nm, the 1580 cm-1 line of guanosine is greatly enhanced in the Z form, whereas with 295 nm excitation, several lines are sensitive to the conformational change: the guanine band around 650 cm-1 and at 1193 cm-1 and the bands of the cytosines at 780 cm-1, 1242 cm-1, and 1268 cm-1. Comparison of the UV resonance Raman spectra of DNA with that of the model compound indicated that resonance Raman spectroscopy allows characterization of the B-to-Z transition from 1 line with 257 nm excitation and from 3 lines with 295 nm excitation. Examination of these 4 lines should permit observation of a few base pairs in Z form in DNA.

L5 ANSWER 60 OF 60 CAPLUS COPYRIGHT 2004 ACS on STN
ACCESSION NUMBER: 1980:599429 CAPLUS
DOCUMENT NUMBER: 93:199429
TITLE: "CARS spectroscopy of fluorescing acridines: intercalation with DNA"
AUTHOR(S): *Tretzel, Joachim; Schneider, Friedemann W.*
CORPORATE SOURCE: Inst. Phys. Chem., Univ. Wuerzburg, Wuerburg, 8700, Fed. Rep. Ger.

SOURCE: **Mol. Mech. Biol. Recognition, Proc. Aharon Katzir-Katchalsky Conf. (1979), Meeting Date 1978, 235-40.** Editor(s): Balaban, Miriam. Elsevier: Amsterdam, Neth.
CODEN: 43GWAZ
DOCUMENT TYPE: Conference
LANGUAGE: English
AB Resonance coherent anti-Stokes Raman spectroscopy (CARS) of the strongly fluorescing acridine dyes proflavine (I) and acridine orange (II) in MeOH is presented. I and II monomers showed great similarities in the 1200-1600 cm-1 region, attributable to the acridine ring modes which are not significantly altered by Me substitutions in the adjacent amino groups. The multiplex resonance CARS spectrum of I in aqueous solution showed differences in intensities from that in MeOH, partially reflecting the shift in absorption spectrum between the 2 solvents. Complexed dye shows greater similarities to free dye in MeOH than to free dye in H2O due to a similar red shift in the absorption spectrum of the dye on incubation in aqueous solution Thus intercalation does not affect the vibrational frequencies of the acridine ring; however, intensity changes on complexation are indicated.

FILE 'CAPLUS' ENTERED AT 16:17:50 ON 06 OCT 2004
L1 1 ("COHERENT ANTI-STOKES RAMAN" OR (CARS (S) RAMAN)) AND (RESONAN? (5A) (CHAMBER? OR CAVIT?)) AND (MICROCHANNEL? OR MICROFLUID? OR MICROFABRICAT?)
L2 21 ((COHERENT OR ENHANCED OR STIMULAT?) (5A) RAMAN) AND (RESONAN? (4A) (CHAMBER? OR CAVIT?))
L3 6 L2 AND MOLECUL?
L4 16 RAMAN AND (MICROCHANNEL? OR MICROFABRICAT? OF MICROFLUID?)

L3 ANSWER 5 OF 6 CAPLUS COPYRIGHT 2004 ACS on STN
ACCESSION NUMBER: 1985:32933 CAPLUS
DOCUMENT NUMBER: 102:32933
TITLE: "Local fields in cavity sites of rough dielectric surfaces"
AUTHOR(S): *Liver, Naomi; Nitzan, Abraham; Gersten, J. I.*
CORPORATE SOURCE: Dep. Chem., Tel Aviv Univ., Tel Aviv-Jaffa, 69978, Israel
SOURCE: **Chemical Physics Letters (1984), 111(4-5), 449-54**
CODEN: CHPLBC; ISSN: 0009-2614
DOCUMENT TYPE: Journal
LANGUAGE: English
AB The results of recent expts. which indicate that surface-enhanced Raman scattering from mols. adsorbed on coldly evaporated Ag films is associated with cavity sites is interpreted as an electromagnetic field enhancement in regions enclosed by several Ag grains. No such enhancement is obtained for a wedge geometry. Cavity sites are strong enhancement centers for resonance optical phenomena such as fluorescence and photochem. yield.

L3 ANSWER 6 OF 6 CAPLUS COPYRIGHT 2004 ACS on STN
ACCESSION NUMBER: 1967:438052 CAPLUS
DOCUMENT NUMBER: 67:38052
TITLE: Stimulated Raman emission without an exterior resonating cavity
AUTHOR(S): Bisson, Georges; Bret, Georges; Denariez, Marguerite M.; Gires, Francois; Mayer, Guy; Paillette, Michel
CORPORATE SOURCE: Dep. Rech. Electro-Optiques, Compagn. Gen. TSF, Domaine Corbeville, Orsay, Fr.
SOURCE: Journal de Chimie Physique (1967), 64(1), 197-208
CODEN: JCPQAY
DOCUMENT TYPE: Journal
LANGUAGE: French
AB The fundamental concept of a linear effect in the equation <SYM119>L - <SYM119>v = <SYM119>S, where <SYM119>v is the frequency peculiar to the illuminated substance, applies only for low intensities, and a single pass. By the given equation for dnS/dt, the spontaneous Raman effect is dependent on the shape and height of <SYM119>S; however, it is more convenient to use a designation b = cm./Mw. to describe a proportionality constant illustrated by data for 6 liquids or for H at 100 atmospheric A discontinuity of behavior appears for giant pulse laser illumination with the production of more intense stimulated or anti-Stokes frequencies, <SYM119>L - x<SYM119>v, where x is a continuous series 1, 2, 3, etc. Theoretical models have been based either on the unsteady state, or on coherent mol. vibration necessarily based on polarizability in an electromagnetic field. The given math. analysis may be finalized in a series vector field: the accumulated intensities are shown by this. The degree of activation dnS/dt = 1/<SYM116> is decreased by losses in a cavity, but the wave heights are reinforced. On the other hand, in the absence of a resonant cavity the harmonic content may be 102 as great. Expts. with a 500 Mc. (divergence 10-3 radian) laser suggest that the Raman effect is independent of "self trapped" exciting radiation. Three types of Raman effect are observed, a continuous (acetone, low pressure H), a discontinuous (C6H6, CCl4), and a discontinuous type affected by the phys. dimensions (PhNO2, CS2). With convergence of the excitation and causation of stimulated Raman emission, the effect of self-trapping is integral with d. fluctuations and anomalies in the distribution of Stokes and anti-Stokes emissions. Fluctuations normal to noncompressed gas have not been shown to be of influence. Major influence is shown by electrostriction, mol. polarization, and dispersion. The math. expressions given in the paper are applied to detailed exptl. work, and critical appraised. The use of a resonant cavity obscures the various effects, thus causing their elucidation to become more difficult. 61 references.

L4 ANSWER 1 OF 16 CAPLUS COPYRIGHT 2004 ACS on STN
TI Methods and device for DNA sequencing using Raman spectroscopy

L4 ANSWER 2 OF 16 CAPLUS COPYRIGHT 2004 ACS on STN
TI Monitoring of chemical reactions within microreactors using an inverted Raman microscopic spectrometer

L4 ANSWER 3 OF 16 CAPLUS COPYRIGHT 2004 ACS on STN
TI Methods and device for DNA sequencing using Raman spectroscopy
L4 ANSWER 4 OF 16 CAPLUS COPYRIGHT 2004 ACS on STN
TI Method of immobilizing biologically active molecules for assay purposes in a microfluidic format
L4 ANSWER 5 OF 16 CAPLUS COPYRIGHT 2004 ACS on STN
TI Fabrication of 3D interconnected network of microchannels inside silica by femtosecond irradiation and etching
L4 ANSWER 6 OF 16 CAPLUS COPYRIGHT 2004 ACS on STN
TI Defect and Raman spectroscopy of chemical vapor deposition grown diamond films
L4 ANSWER 7 OF 16 CAPLUS COPYRIGHT 2004 ACS on STN
TI Micromechanical structure development for chemical analysis: study of porous silicon as an adsorbent
L4 ANSWER 8 OF 16 CAPLUS COPYRIGHT 2004 ACS on STN
TI Direct laser writing of microstructures in diamond-like carbon films
L4 ANSWER 9 OF 16 CAPLUS COPYRIGHT 2004 ACS on STN
TI Fluorescence detection and size measurement of single DNA molecules
L4 ANSWER 10 OF 16 CAPLUS COPYRIGHT 2004 ACS on STN
TI Simultaneous spectral and temporal resolution in a single photon counting technique
L4 ANSWER 11 OF 16 CAPLUS COPYRIGHT 2004 ACS on STN
TI Multichannel time-correlated single photon counting: spectroscopy and time-gated imaging using a resistive anode photomultiplier tube
L4 ANSWER 12 OF 16 CAPLUS COPYRIGHT 2004 ACS on STN
TI The use of a charge-coupled device and position sensitive resistive anode detector for multiorder spontaneous Raman spectroscopy from silicon
L4 ANSWER 13 OF 16 CAPLUS COPYRIGHT 2004 ACS on STN
TI Non-equilibrium carriers in gallium arsenide: secondary emission during the first two picoseconds
L4 ANSWER 14 OF 16 CAPLUS COPYRIGHT 2004 ACS on STN
TI Picosecond fluorescence spectroscopy by time-correlated single-photon counting
L4 ANSWER 15 OF 16 CAPLUS COPYRIGHT 2004 ACS on STN
TI Raman spectroscopy of thin films on semiconductors
L4 ANSWER 16 OF 16 CAPLUS COPYRIGHT 2004 ACS on STN
TI Multichannel light detectors and their use for CARS spectroscopy

L4 ANSWER 2 OF 16 CAPLUS COPYRIGHT 2004 ACS on STN
ACCESSION NUMBER: 2003:819259 CAPLUS
DOCUMENT NUMBER: 140:52370
TITLE: Monitoring of chemical reactions within microreactors using an inverted Raman microscopic spectrometer
AUTHOR(S): Fletcher, Paul D. I.; Haswell, Stephen J.; Zhang, Xunli
CORPORATE SOURCE: Department of Chemistry, The University of Hull, Hull, UK
SOURCE: Electrophoresis (2003), 24(18), 3239-3245
CODEN: ELCTDN; ISSN: 0173-0835
PUBLISHER: Wiley-VCH Verlag GmbH & Co. KGaA

DOCUMENT TYPE: Journal
LANGUAGE: English
AB An inverted Raman microscope spectrometer was used to profile the spatial evolution of reactant and product concns. for a chemical reaction within a microreactor operating under hydrodynamic flow control. The Raman spectrometer was equipped with a laser source at wavelength of 780 nm, confocal optics, a holog. transmission grating, and a charge-coupled device (CCD) detector. The microreactor consisted of a T-shaped channel network etched within a 0.5 mm thick glass bottom plate that was thermally bonded to a 0.5 mm thick glass top plate. The ends of the channel network were connected to reagent reservoirs that were linked to a syringe pump for driving the solns. by hydrodynamic pumping within the channels. The microchannels were 221 <SYM109>m wide and 73 <SYM109>m deep. The synthesis of Et acetate from ethanol and acetic acid was studied as a model system within the microreactor as Raman scattering bands for each reactant and product species were clearly resolved. Raman spectral intensities of each band were proportional to concentration for each species and hence all concns. could be quant. measured after calibration. By scanning specific Raman bands within a selected area in the microchannel network at given steps in the X-Y plane, spatially resolved concentration profiles were obtained under steady-state flow conditions. Under the flow conditions used, different positions within the concentration profile correspond to different times after contact and mixing of the reagents, thereby enabling one to observe the time dependence of the product formation. Raman microscopy provides a useful complementary technique to UV/visible absorbance and fluorescence methods for the in situ monitoring and anal. of chemical reaction species having their lowest S0-S1 absorption bands too far in the UV to be of use, due to their probable overlap with the bands from other reactant, product and solvent mols. REFERENCE COUNT: 16

L4 ANSWER 9 OF 16 CAPLUS COPYRIGHT 2004 ACS on STN
ACCESSION NUMBER: 1993:142791 CAPLUS
DOCUMENT NUMBER: 118:142791
TITLE: Fluorescence detection and size measurement of single DNA molecules
AUTHOR(S): Castro, Alonso; Fairfield, Frederic R.; Shera, E. Brooks
CORPORATE SOURCE: Biophys. Group, Los Alamos Natl. Lab., Los Alamos, NM, 87545, USA
SOURCE: Analytical Chemistry (1993), 65(7), 849-52
CODEN: ANCHAM; ISSN: 0003-2700
DOCUMENT TYPE: Journal
LANGUAGE: English
AB A technique was developed for the detection and size discrimination of single DNA mols. in a hydrodynamically focused flowing solution Double-stranded <SYM108> DNA mols. at 3 + 10-15M were stained with the fluorescent dye TOTO-1 and were individually detected. The technique makes use of a frequency-doubled mode-locked Nd:YAG laser to repetitively excite the mols. as they traverse the tightly focused laser beam. The

flowing sample solution was hydrodynamically focused down to a 20-<SYM109>m-diameter
stream by a rapidly flowing H2O sheath. The sheath flow technique is well suited for laser-induced fluorescence detection of small-volume, low-concentration samples. The emitted fluorescence photon burst originating from a single DNA mol. was detected with a microchannel plate photomultiplier-based single-photon counter, which used time-gated electronics for Raman and Rayleigh scattering rejection. A mixture of <SYM108> DNA and smaller single-cut fragments were simultaneously detected and identified by size. The advantages over other techniques for the detection and size determination of DNA fragments are discussed.